

FOREWARD

This booklet has been prepared to serve as a general guide for single-family house construction. Readers are urged to consult with the Building and Safety Bureau whenever in doubt as to any specific requirements or procedures.

EUGENE J. ZELLER
Director
Department of Planning and Building

This information is available in an alternative format by request at (562) 570-6651 or:

- T.D.D. (562) 570-6793 for hearing impaired.
- On the Internet at <http://www.longbeach.gov/plan/helphome>

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DEPARTMENTAL PHONE NUMBERS

The Department maintains the Development Services Center from 7:30 a.m. to 4:30 p.m., Monday through Friday on the 4th floor of City Hall, 333 West Ocean Boulevard, for issuing permits and providing information.

| | |
|--|----------------|
| Building and Permits | (562) 570-6651 |
| Zoning | (562) 570-6194 |
| Structural Plan Checking | (562) 570-6423 |
| Electrical | (562) 570-6091 |
| Plumbing | (562) 570-6085 |
| Mechanical | (562) 570-6263 |
| Inspection Request (24 Hours) | (562) 570-6105 |
| Flood Data Information | (562) 570-6352 |
| Business License | (562) 570-6211 |
| Fire Department Plan Information | (562) 570-2563 |
| Fax Number | (562) 570-6753 |

Building and Permits if you need information on the building code, fees, and permit forms.

Zoning will give you information on setbacks, side yards, rear yards, front yards, and general zoning information. You can also obtain information on applying for zoning or other variances.

Structural Plan Checking answers technical engineering questions and the complex building code questions.

Electrical answers electrical code questions and information on electrical permits.

Plumbing answers plumbing code questions and information on plumbing permits.

Mechanical answers mechanical code questions and information on mechanical permits. State of California energy requirements on heating are also answered at this number.

To request an inspection, call the inspection request line at (562) 570-6105. This phone number can be called 24 hours a day.

PLAN INFORMATION

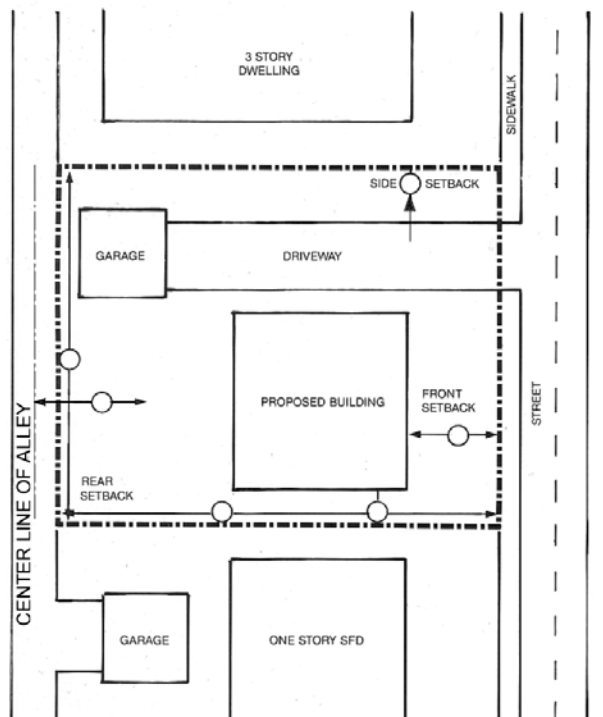
WHAT ARE PLANS?

Some form of plan must accompany every application for a permit for a new building structure or addition. Any application requesting a zoning or subdivision action also requires the submittal of plans. The combination and number of plans required depends on the type of application. For example, the types of plans and number of copies required for a Conditional Use Permit varies from those required for a Lot Line Adjustment.

WHAT IS A SITE PLAN?

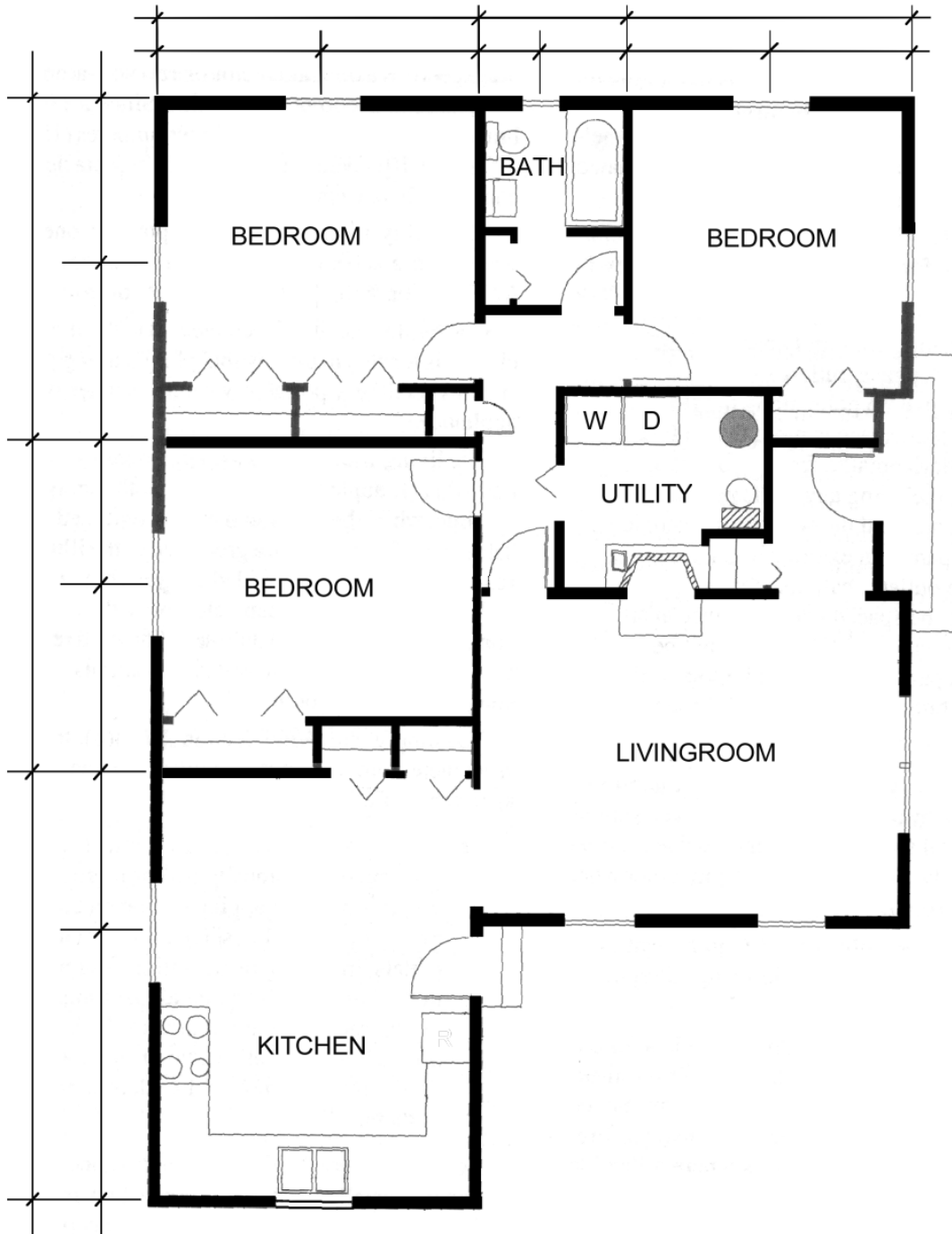
A Site Plan is a plan drawn to scale showing the uses and structures proposed for a specific parcel of land and adjoining uses. A Site Plan should include the following information:

1. Lot lines and dimensions.
2. Location of existing and proposed buildings properly dimensioned from property lines.
3. Location of buildings on adjoining and abutting lots with note as to height in stories.
4. Uses of adjoining and abutting lots.
5. All parking and loading facilities showing stalls, access, circulation, docks, ramps and curb cuts and all fences dimensioned.
6. Locations of all trash containers.
7. All existing and proposed easements.
8. All setback lines, properly dimensioned. All contiguous and adjacent properties, streets and alleys, showing centerline and both curb lines, street widths, right-of-way lines and street names.
9. Lot size, lot coverage, building area (by floor) and total floor area to lot size ratio.
10. Site Plan shall be to scale with north arrow.



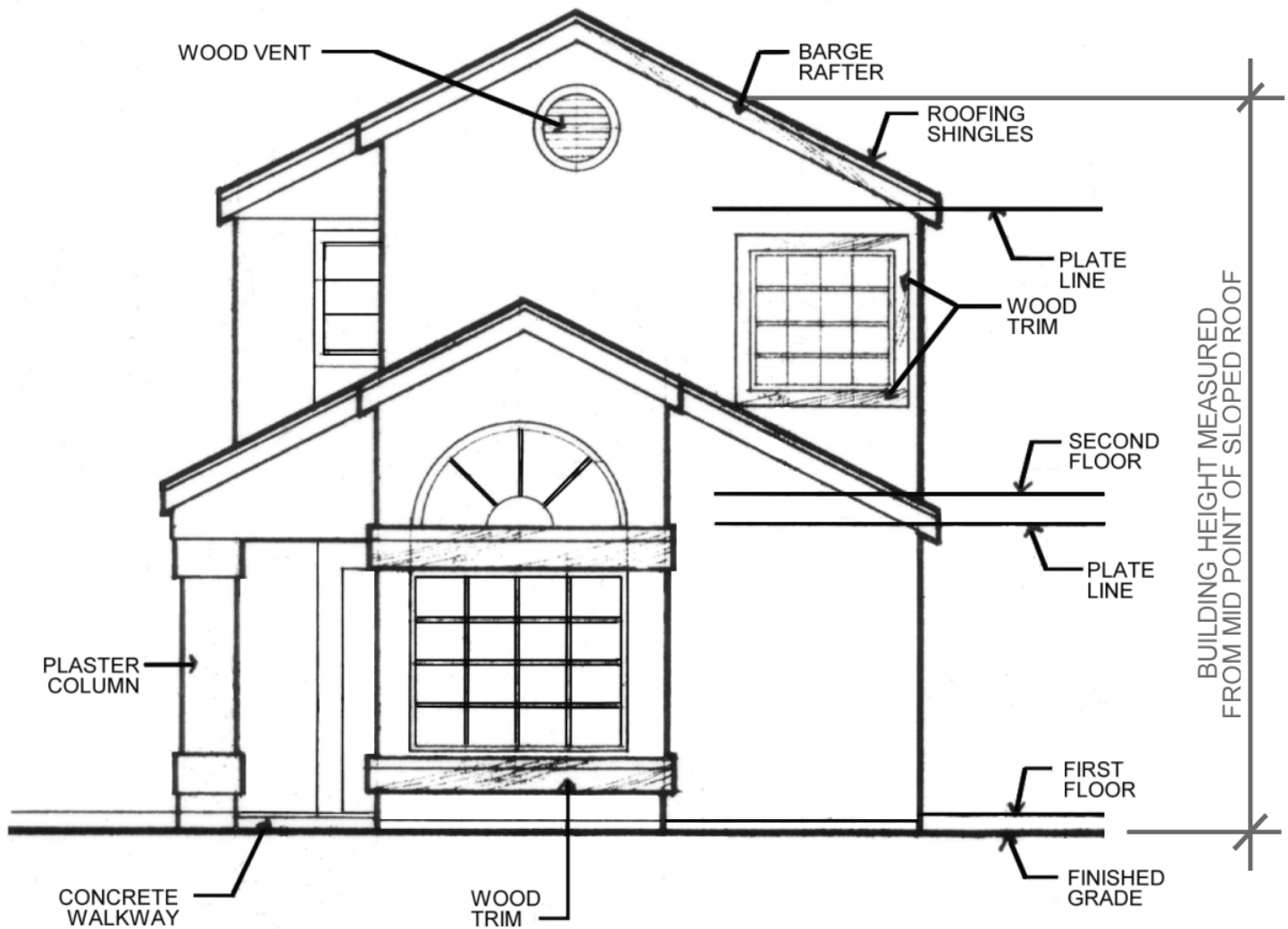
WHAT IS A FLOOR PLAN?

A Floor Plan is a diagram that shows general room arrangements including room sizes, window sizes and types and uses of all rooms. Floor plans may be typical floor plans if several units are included.



WHAT IS AN ELEVATION?

An Elevation is a drawing showing the exterior sides of a building. Elevations should be drawn to scale, dimensioned from roof peak and from eaves to ground and should include all sides of the building. Materials of the facade should also be specified. Photographs may be substituted for elevations for existing buildings. An outline elevation of adjacent buildings should also be submitted.



LANDSCAPE PLAN

A Landscape Plan consists of two parts:

1. A planting plan and irrigation plan: A planting plan shows the species, sizes and location of all plants.
2. An irrigation plan shows the layout of the sprinkler system and includes the sizes of the pipes and the spacing of the sprinkler heads.

IS THERE A STANDARD FORMAT FOR PLANS?

All plans should be neat, clear and fully dimensioned. Where feasible, plans should be drawn to 1/4"-1'-0" scale and reduced to 18" x 24" size. A north arrow should always be included on the plot plan.

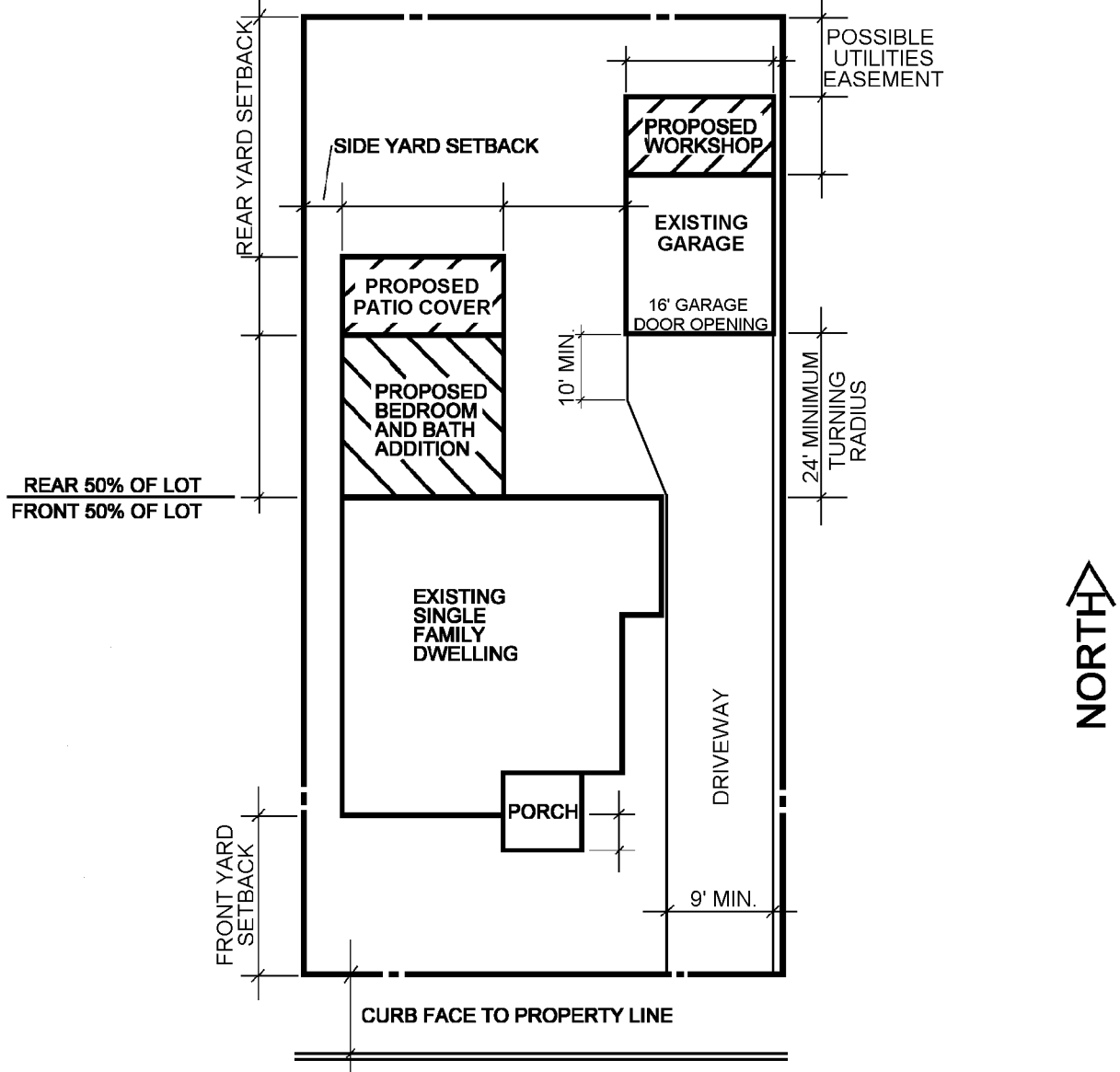
HOW MANY COPIES OF PLANS ARE REQUIRED?

The number of copies of plans required depends upon the type of application submitted. For small residential additions and alterations, two sets of plans may be acceptable for submittal. Information regarding the number and combination of plans required for each application can be obtained from the Department of Planning and Building on the fourth floor of City Hall or by calling (562) 570-6651 between 7:30 a.m. and 4:30 p.m. Monday through Friday.

TYPICAL PLOT PLAN

A plot plan drawn to scale showing your proposed addition is the first requirement. A typical example is shown **on the next page**. Every permit application for a new building, structure or addition shall be accompanied by a plot plan drawn to appropriate scale on a form provided by the department. The plan must show all necessary information as to size and shape of the lot, all existing buildings, location and size of work proposed, distances of the construction from all property lines and distances from other buildings on the property. The plot plan will be reviewed by the zoning staff for compliance with City requirements for land use, yard sizes, lot coverage, etc.

**CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT**



TYPICAL PLOT PLAN DETAIL

BL-9515/90)

DEPARTMENT USE ONLY

| ZONE | SETBACKS | F | S | R | CF TO PL | PAGE NO. | ZONING APPROVED <input type="checkbox"/> INT | PLANNING STAMP REQUIRED <input type="checkbox"/> | SPECIAL PLANNING PERMIT REQ'D <input type="checkbox"/> |
|------|----------|---|---|---|----------|----------|---|---|---|
|------|----------|---|---|---|----------|----------|---|---|---|

Date Rec'd. _____ Check One: New _____ Alteration _____ Addition _____ Repair _____ Demolition _____

Location of Job _____ Zone _____

Owner's Name _____ Address _____

Lot _____

Block _____ Tract _____

Contractor's Name _____ Address _____

Valuation Of Proposed Work: \$ _____ Applicant _____ Phone _____

CHECKED BY: Counterman _____ Field Inspector _____ Plan Checker _____

PLAN CHECK SCREENING CHECKLIST

The items listed below may be required for the building plan check. Upon further review of the submitted drawings and calculations, additional information may be required.

SITE PLAN – A site plan drawn to scale (typically 1/8" per ft.) depicting property lines, adjacent streets, a north arrow, contours or drainage lines, and the site address and name(s) of the property owner. The proposed building or addition shown with setbacks from the property lines and any other building or structure on the site.

FLOOR PLAN – A plan drawn to scale (typically 1/4" per ft.) depicting proposed and existing bearing walls, partitions, doors, windows, and electric and plumbing fixtures. The use of each room shall be labeled on the plans.

ROOF PLAN – A site plan drawn to scale (typically 1/4" per ft.) depicting the roof pitch, roofing material, drainage pattern, eave overhang and gutters.

FOUNDATION PLAN – A plan drawn to scale depicting proposed continuous and pad footings, and the size and location of anchor bolts and hold downs.

FRAMING PLAN – A plan drawn to scale depicting the size and spacing of proposed roof rafters, ceiling joists, floor joists, beams, columns and shear walls.

EXTERIOR ELEVATIONS – A plan drawn to scale depicting exterior wall finish, finish floor elevations, plate heights and adjacent grade elevations.

CROSS SECTION – A plan drawn to scale depicting the full height and width of the building with cross references to framing and foundation details.

SCHEDULES – Specify the size, type and other information for all doors and windows. Provide schedules for roof and floor diaphragms and shear walls.

DETAILS – All details should be cross-referenced on the plans.

GENERAL NOTES AND MATERIAL SPECIFICATIONS – Provide on the plans.

TITLE 24 ENERGY – Indicate prescriptive compliance or provide performance calculations along with CF-1R and MF1-R forms.

TITLE 24 ACCESSIBILITY – Show compliance with the State disabled access requirements.

STRUCTURAL CALCULATIONS – Provide lateral and vertical calculations, signed and sealed by a licensed architect, or an engineer (civil or structural).

SOIL REPORT – Provide 2 sets of geotechnical reports for the project.

STORMWATER MANAGEMENT PROGRAM – Show on the plan, NPDES and SUSMP requirements, as applicable.

GENERAL PLANNING REQUIREMENTS

RESIDENTIAL ZONING STANDARDS

In addition to building, plumbing, mechanical and electrical codes, the City of Long Beach has adopted zoning regulations. These standards generally regulate areas of "compatibility" and aesthetics such as minimum building setbacks, maximum building height and maximum number of dwelling units per lot.

The City is divided into zoning "districts", each of which has a specific set of development standards. The residential districts begin with the "R" prefix such as the "R-1-N" (single-family residential), "R-2-N" (two-family residential) or "R-4-N" (multi-family residential) districts.

The following pages summarize some of the basic zoning regulations. If you have detailed questions, or wish to determine which zoning district your property is in, Zoning information can be obtained at either the Zoning Counter in the Development Services Center or over the telephone by calling (562) 570-6194 between the hours of 7:30 a.m. and 4:30 p.m. Monday – Friday. The zoning information telephone line is equipped with a message machine if the line is busy. If you call and get the machine, leave a specific message, including the property address, your name and phone number, and a planner will return your call.

HOW TO USE RESIDENTIAL DEVELOPMENT STANDARDS TABLE 31-2A (SEE PAGE 15)

UNITS PER LOT

This column indicates the maximum number of dwellings permitted per lot. In the R-1-N district, only one dwelling is permitted per lot.

LOT AREA PER UNIT

This column is used to determine the exact number of units permitted on a lot. For example, in the R-2-N district, the minimum lot area per unit is 3,000 square feet. In order to build two units on a lot in the R-2-N district, the lot must have an area of at least 6,000 square feet. If your lot is smaller than 6000 square feet, you can only have one unit.

MINIMUM LOT AREA/MINIMUM LOT FRONTAGE

These standards only apply to new subdivisions. For example: In order to divide one lot into two lots in the R-1-N district, the existing parcel would have to be at least 12,000 square feet in area with at least 100' of street frontage in order to provide two lots which are 6,000 square feet each with 50' of frontage each.

MINIMUM YARD SETBACK

The minimum yard setbacks indicate the minimum distance that a new building or an addition must be from a property line. There are exceptions to the setback requirements for projections (such as chimneys and bay windows) and for accessory structures (such as garages and workshops).

MAXIMUM HEIGHT

This column indicates the maximum building height in feet and stories. This dimension is typically measured from the average elevation of the street curb (in front of the property) to either the top of a flat roof or the mid-point of a pitched roof. In the R-1-N district, the maximum building height is 25' and the maximum number of stories is two.

MAXIMUM LOT COVERAGE

This standard limits the amount of lot area that can be covered by buildings. For example, in the R-1-N district, a maximum of 50% of the total lot area can be covered by buildings (excluding the garage area up to 600 square feet).

MINIMUM USABLE OPEN SPACE PER UNIT

This standard requires that a minimum amount of "usable" open space (rear yard, patios, balconies or decks) must be provided on each lot. Driveways and front yard setbacks are not included as usable open space. For example, in the R-1-N district, a lot with an area of 5,000 square feet must provide 800 square feet of usable open space ($5,000 \times .16 = 800$).

FLOOR AREA RATIO

This standard is similar to lot coverage except that it is a limitation on total floor area on all floors of a building as compared to your lot.

RESIDENTIAL DEVELOPMENT STANDARDS

TABLE 31-2A
(Footnotes on next page)

| District | Units Per Lot | Lot Area Per Unit (Sq. Ft.) | Minimum Lot Width (Sq. Ft.) (a,c) | Minimum Yard Setbacks (Ft.) (l) | | | Maximum Height (d,h) | Maximum Lot Coverage (% of Lot) | Minimum Usable Open Space Per Unit | Floor Area Ratio |
|----------|---------------|-----------------------------|-----------------------------------|---------------------------------|------------|------------|-------------------------|---------------------------------|------------------------------------|------------------|
| | | | | Front | Side | Rear (k) | | | | |
| R-1-S | 1 | 2,400 | 30 | 8(i) | 3 | 8 | 24 ft / 28 ft | N/A | 6% (o) | 1.2 |
| R-1-M | 1 | 3,600 | 40 | 8 | 4 | 8 | 25 ft. 2 St. | N/A | 6% (o) | 0.67 |
| R-1-N | 1 | 6,000 | 50 | 20 | 4 (b) | 1st St. 10 | 25 ft. 2 St. | 50% | 16% (o) | 0.6 |
| | | | | | | 2nd St. 30 | | | | |
| R-1-L | 1 | 12,000 | 60 | 20 | 6 | 30 | 25 ft. 2 St. | 40% | 23% (o) | 0.6 |
| R-1-T | 1 | 3,000 | 25 (g) | 10 | 5 | 8 | 25 ft. 2 St. | N/A | 6% (o) | 1.2 |
| R-2-S | 2 | 1,200 | 40 | 15(i) | 3 | 10 | 24 ft / 28 ft | N/A | 2% (o) | 1.3 |
| R-2-I | 2 | 1,000 | 40 | 3(i) | 3 | 8 | 32 ft / 35 ft 3 St. (e) | N/A | 2% (o) | N/A |
| R-2-N | 2 | 3,000 | 50 | 15 | 4 (b) | 20 | 25 ft. 2 St. | 60% | 6% (o) | 0.60 |
| R-2-A(n) | 2 | 3,000 | 50 | 15 | 4 (b) | 20 | 25 ft. 2 St. | 60% | 6% (o) | 0.60 |
| R-2-L | 2 | 4,000 | 50 | 15 | 4 | 10 | 35 ft. 2 St. | 40% | 8% (o) | N/A |
| R-3-S(l) | 3 | 2,100 | 50 | 15 | 10% (q) | 20 | 25 ft. 2 St. | N/A | 250 (p) | N/A |
| R-3-4 | 4 | 1,700 | 50 | 15 | 10% (q) | 20 | 25 ft. 2 St. | N/A | 200 (p) | N/A |
| R-3-T(l) | N/A | See Table 31-2B | 25 (g) | 15 | 10% (q) | 20 | 28 ft 2 St (f) | N/A | 250 (p) | N/A |
| R-4-R(l) | N/A | See Table 31-2B | 120 | 15 | 10% (q) | 20 | 28 ft 2 St (f) | N/A | 150 (p) | N/A |
| R-4-N(l) | N/A | See Table 31-2B | 120 | 15 | 10% (q)(r) | 20 (r) | 38 ft 3 St (f) | N/A | 150 (p) | N/A |
| R-4-H(l) | N/A | See Table 31-2B | 120 | 10(m) | 10% (q)(r) | 20 (r) | See Table 31-3A | 50% | 150 (p) | N/A |
| RM | N/A | 2,400 | 120 | 10 | 4 | 10 | 30 ft 2 St | 65% | 200 (p) | N/A |
| R-4-U(l) | N/A | See Table 31-2B | 180 | 10 | 10% (q)(r) | 20 (r) | 65 ft 5 St. (f) | N/A | 150 (p) | 3.0 |

RESIDENTIAL DEVELOPMENT STANDARD FOOTNOTES

The density allowed shall be that provided in the row corresponding to the site width and area. If the site width and area are in ranges located in different rows, then the higher of the two densities is allowed.

Abbreviations: Sq. Ft. = square feet; St. = story

NOTES: Table 31-2A, LONG BEACH MUNICIPAL CODE, Residential Development Standards

- (a)** If this lot size exceeds the standards for the neighborhood (as defined in the subdivision regulations), the standard of the neighborhood may be used.
- (b)** If a lot is twenty-seven feet or less in width, see Section 21.31.215(F), special narrow lot standards.
- (c)** These standards apply only to new subdivisions of land area. They do not apply to new construction on existing lots or to air space divisions of existing lots.
- (d)** In general, height is measured to the midpoint of the roof (Section 21.15.1330 - Definitions). However, in some zones, the building height limit consists of two numbers. The first number indicates the height of the midpoint of roof, and second number indicates height of building measured to peak of roof. A project shall conform to both standards.
- (e)** An additional two feet may be permitted to accommodate access stairs to the roof.
- (f)** See Section 21.31.220 for special height provisions.
- (g)** New subdivisions, including corner lots, shall orient the lots to the side street.
- (h)** For garages and other accessory structures, refer to Section 21.31.245 (Accessory structures).
- (i)** Average setback may apply as outlined in Section 21.31.215(C) (Front yard averaging).
- (j)** Special standards apply for reverse corner lots as specified in Section 21.31.215(D) (Rear yard).
- (k)** The setback shall be measured from the centerline of an abutting alley where such exists. For shallow lots, see Special Standards in Section 21.31.215(D).
- (l)** If the garage takes direct access from the street, the garage shall be set back pursuant to Section 21.31.245.
- (m)** Commercial uses-see Special Development Standard, Section 21.45.160(F).
- (n)** One unit is limited to not more than eight hundred square feet or twelve percent of lot area, whichever is greater.
- (o)** Percent of lot area per unit.
- (p)** Square foot per unit. See Sections 21.31.230 (Usable Open Space) and 21.31.240 (Privacy Standards) for detailed standards.
- (q)** The side yard setback is ten percent of lot width on each side, but in no case shall the interior side yard setback be required to exceed ten feet (be required to exceed except as specified in footnote(s)). The side street side yard setback shall be fifteen percent of lot width, but in no case shall it be required to exceed fifteen feet. Neither setback shall ever be less than five feet.
- (r)** See Subsections 21.31.215.D.3 and 21.31.215.E.3, Special Side and Rear Yard Setback Restrictions.

RESIDENTIAL DENSITIES FOR MULTI-FAMILY DISTRICTS

Table 31-2

| District | Site Area (Sq. Ft.) | Site Width (Ft.) | Permitted Density Sq. Ft. of Site Area Per Unit |
|----------|---|---|--|
| R-3-T | 0 - 3,200 3,201 - 15,000 15,001 or more | 0 - 25 26 - 120 121 or more | 1 unit per lot 1 unit per 3,000 sq. ft. 1 unit per 2,400 sq. ft. |
| R-4-R | 0 - 3,200 3,201 - 15,000 15,001 or more | 0 - 25 26 - 120 121 or more | 1 unit per lot 1 unit per 1,500 sq. ft. 1 unit per 1,450 sq. ft. |
| R-4-N | 0 - 3,200 3,201 - 15,000 15,001 - 22,500 22,501 or more | 0 - 25 26 - 120 121 - 180 181 or more | 1 unit per lot 1 unit per 1,500 sq. ft. 1 unit per 1,200 sq. ft. 1 unit per 975 sq. ft. |
| R-4-H | 0 - 3,200 3,201 - 15,000 15,001 - 22,500 22,501 or more | 0 - 25 26 - 120 121 - 180 181 or more | 1 unit per lot 1 unit per 1,500 sq. ft. 1 unit per 1,200 sq. ft. See Table 31.3A |
| R-4-U | 0 - 3,200 3,201 - 15,000 15,001 - 22,500 22,501 - 30,000 30,001 or more | 0 - 25 26 - 120 121 - 180 181 - 240 241 or more | 1 unit per lot 1 unit per 1,500 sq. ft. 1 unit per 975 sq. ft. 1 unit per 500 sq. ft. 1 unit per 400 sq. ft. |

BUILDING REQUIREMENTS

GENERAL

1. Permits are required before starting work. Permits are available to owners of single-family dwellings and two family dwellings provided the owner installs the work, or a member of the immediate family, and the owner resides or intends to reside in such dwelling.
2. Permits become null and void if work authorized is not commenced within 180 days of the issuance or if such work is suspended or abandoned at any time after the work is commenced for a period of 180 days.
3. No work shall be covered or concealed without first having been inspected and approved.

WHAT ARE CONSTRUCTION PERMITS?

Construction Permits are obtained through the Department of Planning and Building which authorize the construction or remodeling of a building in the City of Long Beach.

There are six common types of permits:

1. **Building Permit** is required to construct or modify a building or structure.
2. **Electrical Permit** is required to install or modify an electrical system.
3. **Plumbing Permit** is required to install or modify a plumbing system.
4. **Mechanical Permit** is required to install or modify heating, ventilation, refrigeration, air conditioning and other related systems.
5. **Combination Permit** is for work performed on a single-family dwelling or duplex. A Combination Building Permit covers all of the building, electrical, plumbing, and mechanical work necessary to complete the job.
6. **Fence Permit** is required for any fence over four feet high or retaining wall over four feet high.

CODES AND LAWS

The Department of Planning and Building is the agency charged with the administration and enforcement of municipal zoning and building regulations and requirements prescribed by California State law Title 24. The City of Long Beach uses the following model codes as the municipal building laws:

Uniform Building Code
Uniform Plumbing Code
Uniform Mechanical Code
National Electrical Code

All California cities and counties and hundreds of other jurisdictions nationwide follow these model codes.

The Department also enforces certain California State requirements for minimum housing, energy conservation, workers compensation certificates, and access for the physically disabled.

WHEN IS A PERMIT NEEDED?

Most major projects will require a permit of some kind. This is necessary to ensure that all buildings meet minimum standards that protect its occupants and neighbors, not only in everyday living, but also in case of emergencies and natural disasters.

However, some minor alterations are allowed without obtaining permits. The most common exceptions are:

1. Construction of retaining walls or planter boxes less than two feet high.
2. Erection of fences less than four feet high.
3. Construction of unroofed slabs and platforms less than thirty inches high, open walkways, and driveways on grade.
4. Replacement of up to 500 square feet of roofing on an existing building in any twelve-month period.
5. Installation of ceramic tile on floors and countertops, and on walls not more than forty-eight inches high. Replacement of any existing broken or damaged ceramic tiles.
6. Plaster patching not in excess of ten square yards of interior and exterior plaster.
7. Construction of pools not over 24 inches in depth, without electrical or plumbing fixtures.
8. Construction of cases, counters and partitions less than five feet high.
9. Repairs of plumbing leaks and replacement of faucets.
10. Repair or replacement of electrical wall plug receptacles.
11. A detached equipment shed, utility building, children's playhouse or tree house provided that the building is accessory to a dwelling unit and it does not exceed sixty-four (64) square feet in area, nor eight feet in height from floor to roof.

WHO CAN OBTAIN PERMITS?

Permits shall be issued to duly licensed contractors. However, a homeowner can obtain a permit to do the construction, alteration or repair of a one or two-family dwelling and accessory buildings or facilities thereto if:

1. The owner resides or intends to reside in the dwelling, showing proof of residence;
2. The construction is performed by the owner, and
3. The owner signs a statement that no person will be employed in a manner as to become subject to the workers' compensation laws of the State of California. When a permit is taken out, the signature and identity of the applicant must be verified. A California Driver's License, State of California Identification Card, or other positive identification will meet this requirement. Contractors working in the City of Long Beach are required to have a Long Beach business license. If a contractor has employees, proof of Workers' Compensation Insurance must be shown at the time of permit issuance. Contractors working alone may waive this requirement, but must show a pocket copy of their State Contractor's License.

INSPECTION INFORMATION

WHAT IS AN INSPECTION?

A property inspection is the way that the City ensures that new and remodeled buildings are constructed according to the plans approved by the Department of Planning and Building. By actively inspecting in-progress and completed construction, the City can help ensure that buildings meet all health and safety regulations.

WHEN IS AN INSPECTION NEEDED?

Any work which requires a permit will require inspections. When a permit is obtained, an Inspection Record Card will be issued. This card must be posted on the job site. The Inspection Record Card will indicate the first inspection required for a job. The plans which were approved by the Planning and Building Department must also be available for the inspector during each inspection.

HOW CAN AN INSPECTION BE ARRANGED?

An inspection request can be made by calling the Planning and Building Department Inspection Request Line at (562) 570-6105. This number is connected to an answering machine and should be used only to request inspections. The machine is available 24 hours a day.

An inspection request can also be made by calling (562) 570-6651 between the 7:30 a.m. to 4:30 p.m. Monday through Friday.

When calling to request an inspection, please have the following information available:

1. The address of the job;
2. The project number;
3. The type of inspection requested;
4. The type of building (i.e. single family, apartment, commercial)

During the first inspection, the inspector will determine the amount of work which can be completed before the next inspection. Do not work past this point. This process will be repeated for each succeeding inspection.

Some commonly needed inspections are:

Grading: If a project requires grading of the site before construction, a registered inspector must be on-site to provide continuous inspection during grading. In most cases grading is necessary only for projects requiring the removal or addition of large amounts of earth.

Foundation/Slab: This inspection is performed after rough grading and placement of concrete forms and reinforcing steel, but prior to pouring any concrete.

Floor Joist: This inspection is performed after all floor joists and girders have been installed and after under floor plumbing, electrical and mechanical has been installed. Under floor waste and vents shall be tested at the time of inspection.

Roof Sheathing: This inspection is made after the plywood roof sheathing has been installed and all penetrations through roof have been made.

Framing: Inspection is required after the roof covering is installed, exterior doors and windows installed, flashed, and caulked, and electrical, plumbing and heating systems are prepared for rough inspection.

Energy Insulation: Inspection is required after installation, but prior to walls and ceilings being covered.

Lath/Drywall: Exterior lath is inspected after interior nailing of wall cover is completed and paper and wire have been nailed and trim is in place.

Final: This last inspection will occur when all fixtures are in place and the building is ready for occupancy.

HOW MUCH DOES IT COST?

The cost of building inspection is included in the permit fee. However, a \$30.00 reinspection fee may be assessed if an inspection call is made but the work is not ready for inspection or required corrections have not been completed. A reinspection fee may also be charged if the approved plans are not available or the inspector cannot gain access to the site to perform the inspection.

SPECIAL INSPECTIONS

Special Inspections are a service offered by the Planning and Building Department to assist property owners in determining the condition of an existing building.

A special inspection is sometimes required by lending agencies when a property is sold or refinanced. Before starting a major remodeling, a Special Inspection for minimum housing requirements may help identify any existing hazardous conditions. Some new businesses will also require Special Inspections in order to obtain a business license.

Separate inspections of the electrical, plumbing, mechanical, and structural systems in buildings are available.

Homeowners can receive a combined inspection covering minimum housing, health and safety requirements.

Owners will only be required to repair problem areas that have the potential to pose a life-safety hazard.

HOW MUCH DOES A SPECIAL INSPECTION COST?

The fees for special inspections normally range from \$65 - \$120.00; however, the fee may be greater for large or complex projects.

Further information can be obtained by calling (562) 570-6651 between 7:30 a.m. and 4:30 p.m. Monday through Friday.

GENERAL PROCESS

There are a number of general steps in the process for obtaining permits and inspection approvals:

1. An application must be prepared, plans submitted and plan review fees paid.
2. Plans are reviewed for compliance with applicable codes and State Law and either approved or a set of corrections prepared.
3. Corrected plans are submitted, reviewed and approved.
4. The owner, or the contractor, pays the permit fee (and any other applicable fees) obtains the permit, a set of approved plans, and an Inspection Record Card for posting on the site. Inspections for compliance with the approved plans are made at key times during construction and before work is concealed, and approvals recorded on the Inspection Record card. When the work is totally complete, a final inspection is made, the work approved, the hookup of utilities authorized, and a Certificate of Occupancy issued.

CONSTRUCTION NOISE REGULATIONS

The Municipal Code prohibits any construction requiring a permit from producing unusually loud noise during the following hours:

- ❑ Weekdays and Federal Holidays: 7:00 p.m. to 7:00 a.m. the following weekday.
- ❑ Saturdays: Before 9:00 a.m. and after 6:00 p.m.
- ❑ Sundays: All day.

Unusual noise is that which annoys or disturbs a reasonable person of normal sensitivity. In addition to Health Department staff, the regulations may be enforced by police officers. A person found guilty of violating the regulations is subject to a fine or imprisonment, or both. The landowner, construction company owner, contractor, sub-contractor or employer can be a co-defendant whenever an employee is prosecuted for violating the noise regulations. If good cause is shown, the Health Department Noise Control Officer may grant a permit allowing work on Sundays from 9:00 a.m. to 6:00 p.m. The Building Official may authorize emergency work to proceed at any time period.

The Noise Control Officer should be contacted at (562) 570-4000 for any additional information.

STORMWATER POLLUTION

INTRODUCTION TO STORMWATER POLLUTION

Stormwater pollution is rapidly growing in importance as a national environmental issue. In California, stormwater pollution is a major source of water pollution. To help combat the problems of stormwater pollution, federal and state governments have developed a program for monitoring and permitting discharges to municipal storm drain systems, creeks, and water bodies such as the Pacific Ocean.

Municipalities in the Los Angeles area are required by the Clean Water Act to develop stormwater management programs that include requirements for construction activities. Your construction project will need to comply with local municipal requirements. If your construction activity will disturb five acres or more, you must also obtain coverage under the General Construction Activity Permit (see Requirements for Discharges).

Blueprint for a Clean Ocean is an introductory guide to stormwater quality control on construction sites. It contains several principles and techniques that you can use to help prevent stormwater pollution. This booklet has been developed as a resource for all general contractors, homebuilders, and subcontractors working on construction sites.

STORM DRAIN SYSTEM

Stormwater or runoff from sources like sprinklers and hoses flows over the ground into the storm drain system. In the Los Angeles Area, storm drain systems consist of gutters, storm drains, underground pipes, open channels, culverts, and creeks. Storm drain systems are designed to drain directly to the Pacific Ocean with no treatment.

POLLUTION FROM CONSTRUCTION SITES

Stormwater runoff is part of a natural hydrologic process. However, land development and construction activities can significantly alter natural drainage patterns and pollute stormwater runoff. Runoff picks up pollutants as it flows over the ground or paved areas and carries these pollutants into the storm drain system. Common sources of pollutants from construction sites include: sediments from soil erosion; construction materials and waste (e.g., paint, solvents, concrete, drywall); landscaping runoff containing fertilizers and pesticides; and spilled oil, fuel, and other fluids from construction vehicles and heavy equipment.

ADVERSE EFFECTS FROM STORMWATER POLLUTION

Stormwater pollution is a major source of water pollution in California. It can cause declines in fisheries, disrupt habitats, and limit water recreation activities. Even more importantly, stormwater pollution poses a serious threat to the overall health of the ecosystem. To report a Storm Water Pollution violation call (562) 570-DUMP.

REQUIREMENTS FOR DISCHARGES **BEST MANAGEMENT PRACTICES**

MUNICIPAL STORMWATER PROGRAM

Municipalities in the Los Angeles area are required by federal regulations to develop programs to control the discharge of pollutants into the storm drain system, including the discharge of pollutants from construction sites and areas of new development or significant redevelopment. As a result, your development and construction projects may be subject to new requirements designed to improve stormwater quality such as expanded plan check and review, new contract specifications, and increased site inspection.

GENERAL PRACTICES

The following are some general principles that can significantly reduce pollution from construction activity and help make compliance with stormwater regulations easy:

- Identify all storm drains, drainage swales and creeks located near the construction site and make sure all subcontractors are aware of their locations to prevent pollutants from entering them.
- Clean up leaks, drips, and other spills immediately so they do not contact stormwater.
- Refuel vehicles and heavy equipment in one designated location on the site and take care to clean up spills immediately.
- Wash vehicles at an appropriate off-site facility. If equipment must be washed on-site, do not use soaps, solvents, degreasers, or steam cleaning equipment, and prevent wash water from entering the storm drain. If possible, direct wash water to a low point where it can evaporate and/or infiltrate.
- Never wash down pavement or surfaces where materials have spilled. Use dry cleanup methods whenever possible.
- Avoid contaminating clean runoff from areas adjacent to your site by using berms and/or temporary or permanent drainage ditches to divert water flow around the site. Reduce stormwater runoff velocities by constructing temporary check dams and/or berms where appropriate.
- Protect all storm drain inlets using filter fabric cloth or other best management practices to prevent sediments from entering the storm drainage system during construction activities.
- Keep materials out of the rain — prevent runoff pollution at the source. Schedule clearing or heavy earth moving activities for periods of dry weather. Cover exposed piles of soil, construction materials and wastes with plastic sheeting or temporary roofs. Before it rains, sweep and remove materials from surfaces that drain to storm drains, creeks, or channels.
- Keep pollutants off exposed surfaces. Place trash cans around the site to reduce litter. Dispose of non-hazardous construction wastes in covered dumpsters or recycling receptacles.
- Practice source reduction—reduce waste by ordering only the amount you need to finish the job.
- Do not over-apply pesticides or fertilizers and follow manufacturers instructions for mixing and applying materials.
- Recycle leftover materials whenever possible. Materials such as concrete, asphalt, scrap metal, solvents, degreasers, cleared vegetation, paper, rock, and vehicle maintenance materials such as used oil, antifreeze, batteries, and tires are recyclable.

- Dispose of all wastes properly. Materials that cannot be reused or recycled must be taken to an appropriate landfill or disposed of as hazardous waste. Never throw debris into channels, creeks or into wetland areas. Never store or leave debris in the street or near a creek where it may contact runoff.
- Illegal dumping is a violation subject to a fine and/or time in jail. Be sure that trailers carrying your materials are covered during transit. If not, the hauler may be cited and fined.
- Train your employees and inform subcontractors about the stormwater requirements and their own responsibilities.

SPECIFIC PRACTICES

Following is a summary of specific best management practices for erosion and sediment control and contractor activities. For more information on erosion and sediment control BMPs and their design, please refer to the California Storm Water Best Management Practice Handbook for Construction Activity (March 1993).

Soil erosion is the process by which soil particles are removed from the land surface, by wind, water and/or gravity. Soil particles removed by stormwater runoff are pollutants that when deposited in local creeks, lakes, and the Pacific Ocean, can have negative impacts on aquatic habitat. Exposed soil after clearing, grading, or excavation is easily eroded by wind or water. The following practices will help prevent erosion from occurring on the construction site:

- Plan the development to fit the topography, soils, drainage pattern and natural vegetation of the site.
- Delineate clearing limits, easements, setbacks, sensitive or critical areas, trees, drainage courses, and buffer zones to prevent excessive or unnecessary disturbances and exposure.
- Phase grading operations to reduce disturbed areas and time of exposure.
- Avoid excavation and grading during wet weather.
- Limit on-site construction routes and stabilize construction entrance(s).
- Remove existing vegetation only when absolutely necessary.
- Construct diversion dikes and drainage swales to channel runoff around the site.
- Use berms and drainage ditches to divert runoff around exposed areas. Place diversion ditches across the top of cut slopes.

GENERAL SITE MAINTENANCE

CLEAN UP SPILLS IMMEDIATELY AFTER THEY HAPPEN

When vehicle fluids or materials such as paints or solvents are spilled, cleanup should be immediate, automatic, and routine.

- Sweep up spilled dry materials (e.g., cement, mortar, or fertilizer) immediately. Never attempt to "wash them away" with water, or bury them. Use only minimal water for dust control.
- Clean up liquid spills on paved or impermeable surfaces using "dry" cleanup methods (e.g., absorbent materials like cat litter, sand or rags).
- Clean up spills on dirt areas by digging up and properly disposing of the contaminated soil.
- Clean up spills on dirt areas by removing contaminated soil.

- Report significant spills to the appropriate spill response agencies immediately (See reference list on the back cover of this booklet for more information).

Note: *Used cleanup rags that have absorbed hazardous materials must either be sent to a certified industrial laundry or dry cleaner, or disposed of through a licensed hazardous waste disposal company.*

BEST MANAGEMENT PRACTICES

STORE MATERIALS UNDER COVER

Wet and dry building materials with the potential to pollute runoff should be stored under cover and/or surrounded by berms when rain is forecast or during wet weather.

- Store stockpiled materials and wastes under a temporary roof or secured plastic sheeting or tarp.
- Berm around storage areas to prevent contact with runoff.
- Plaster or other powders can create large quantities of suspended solids in runoff, which may be toxic to aquatic life and cause serious environmental harm even if the materials are inert. Store all such potentially polluting dry materials —**especially open bags**—under a temporary roof or inside a building, or cover securely with an impermeable tarp. By storing dry materials under a roof, you may also help protect air quality, as well as water quality. Store building materials under cover. Make sure dumpsters are properly covered to keep out rain.
- Store containers of paints, chemicals, solvents, and other hazardous materials in accordance with secondary containment regulations and under cover during rainy periods.

COVER AND MAINTAIN DUMPSTERS

Open or leaking dumpsters can be a source of stormwater pollution.

- Cover open dumpsters with plastic sheeting or a tarp during rainy weather. Secure the sheeting or tarp around the outside of the dumpster. If your dumpster has a cover, close it.
- If a dumpster is leaking, contain and collect leaking material. Return the dumpster to the leasing company for repair/exchange.
- Do not clean dumpsters on-site. Return to leasing company for periodic cleaning, if necessary.

COLLECT AND PROPERLY DISPOSE OF PAINT REMOVAL WASTES

Paint removal wastes include chemical paint stripping residues, paint chips and dust, sandblasting material and wash water. These wastes contain chemicals that are harmful to the wildlife in our creeks and the water bodies they flow to. Keep all paint wastes away from the gutter, street, and storm drains.

- Non-hazardous paint chips and dust from dry stripping and sandblasting may be swept up or collected in plastic drop cloths and disposed of as trash. Chemical paint stripping residue and chips and dust from marine paints or paints containing lead or tributyl tin must be disposed of as a hazardous waste.
- When stripping or cleaning building exteriors with high-pressure water, cover or berm storm drain inlets. If possible (and allowed by your local wastewater treatment plant),

collect (mop or vacuum) building cleaning water and discharge to the sanitary sewer. Alternatively, discharge non-contaminated wash water onto a dirt area and spade into the soil. Be sure to shovel or sweep up any debris that remains in the gutter and dispose of as garbage.

CLEAN UP PAINTS, SOLVENTS, ADHESIVES, AND CLEANING SOLUTIONS PROPERLY

Although many paint materials can and should be recycled, liquid residues from paints, thinners, solvents, glues, and cleaning fluids are hazardous wastes. When they are thoroughly dry, empty paint cans, used brushes, rags, absorbent materials, and drop cloths are no longer hazardous and may be disposed of as garbage.

- Never clean brushes or rinse paint containers into a street, gutter, storm drain, or creek
- For water-based paints, paint out brushes to the extent possible and rinse to a drain leading to the sanitary sewer (i.e., indoor plumbing).
- For oil-based paints, clean out paint from brushes to the extent possible, and filter and reuse thinners and solvents. Dispose of unusable thinners and residue as hazardous waste.
- Recycle, return to supplier or donate unwanted water-based (latex) paint. You may be able to recycle clean empty dry paint cans as metal.
- Dried latex paint may be disposed of in the garbage.
- Unwanted paint (that is not recycled), thinners, and sludge must be disposed of as hazardous waste.
- More and more paint companies are recycling excess latex paint (See separate list of "Recyclers and Disposal Services" for more information).

KEEP FRESH CONCRETE AND CEMENT MORTARS OUT OF GUTTERS & STORM DRAINS

Concrete and cement-related mortars that wash into gutters and storm drains are toxic to fish and the aquatic environment.

- Avoid mixing excess amounts of fresh concrete or cement mortar on-site.
- Store dry and wet materials under cover, protected from rainfall and runoff.
- Wash out concrete transit mixers only in designated washout areas where the water will flow into settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.
- Whenever possible, return contents of mixer barrel to the yard for recycling. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

DISPOSE OF CLEARED VEGETATION PROPERLY

Cleared vegetation, tree trimmings, and other plant material can cause environmental damage if it gets into creeks. Such "organic" material requires large quantities of oxygen to decompose, which reduces the oxygen available to fish and other aquatic life.

- Do not dispose of plant material in a creek or drainage facility or leave it in a roadway where it can clog storm drain inlets.
- Avoid disposal of plant material in trash dumpsters or mixing it with other wastes. Compost plant material or take it to a landfill or other facility that composts yard waste.
- Recycle yard waste and tree prunings at a landfill that chips and composts plant material.

DEMOLITION WASTE MANAGEMENT

MAKE SURE ALL DEMOLITION WASTE IS PROPERLY DISPOSED

Demolition debris that is left in the street or pushed over a bank into a creek bed or drainage facility causes serious problems for flood control, storm drain maintenance, and the health of our environment. Different types of materials have different disposal requirements or recycling options.

- Materials that can be recycled from demolition projects include: metal framing, wood, concrete, asphalt, and plate glass.
- Materials that can be salvaged for reuse from old structures include: doors, banisters, floorboards, windows, 2x4s, and other old, dense lumber.
- Unusable, un-recyclable debris should be confined to dumpsters, covered at night and during wet weather, and taken to a landfill for disposal.
- Hazardous debris such as asbestos must be handled in accordance with specific laws and regulations and disposed of as hazardous waste. For more information on asbestos handling and disposal regulations, contact the South Coast Air Quality Management District.
- Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

AGENCIES TO CALL IN THE EVENT OF A SPILL

You are required by law to report all significant releases or suspected significant releases of hazardous materials including oil.

- To report a spill, call the following agencies:
 1. Dial 911
 2. Call County of Los Angeles Hotline (800) 303-0003
 3. Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).
- For spills of "Federal Reportable Quantities" of oil, chemicals, or other hazardous materials to land, air, or water, notify the National Response Center (800-424-8802). If you are not sure whether the spill is of a "reportable quantity," call the federal Environmental Protection Agency (800) 424-9346 for clarification.
- For further information, see California Hazardous Material Spill/Release Notification Guidance (State Office of Emergency Services, Hazardous Materials Division).
- Agencies to call if you find or suspect contaminated soil or groundwater
Regional Water Quality Control Board:
Los Angeles Basin (213) 266-7500
California Environmental Protection Agency (Cal EPA), Department of Toxic Substances Control (DTSC) (510) 540-3732
- Documents and available resources
From State Water Resources Control Board (SWRCB) (916) 341-5250
General Construction Activity Storm Water Permit
California Storm Water Best Management Practice Handbook Construction Activity
From Cal EPA, DTSC (916) 322-3670
Waste Minimization for the Building Construction Industry Fact Sheet
- For additional information regarding Planning and Building call (562) 570-6651
- For City of Long Beach Environmental Services Bureau (562) 570-2876 special pick-up.

FLOOD HAZARD INFORMATION

FLOOD INSURANCE

Standard homeowners insurance policies do not cover losses due to floods. However, Long Beach is a participant in the National Flood Insurance Program, which makes it possible for Long Beach property owners to obtain federally backed flood insurance. This insurance is available to any owner of insurable property (a building or its contents) in Long Beach. Tenants may also insure their personal property against flood loss.

Contact your local insurance agent for current insurance rates. The actual cost will vary depending upon amount of coverage and degree of flood hazard. **(See *Flood Zone Map on Page 33.*)** We urge persons who live or own property in flood hazard areas to purchase flood insurance to protect themselves from losses due to flooding. This insurance is required in certain instances, such as the financing of a home with a federally backed mortgage.

FLOOD SAFETY

There are several actions residents of flood hazard areas can take to decrease the potential of injury due to flooding:

1. Know the flood warning procedures.
2. Do not attempt to cross a flowing stream where water is above your knees.
3. Keep children away from flood waters such as rivers, ditches, culverts, and storm drains.
4. If your vehicle stalls in high water, abandon it immediately and seek higher ground.
5. Evacuate the flood hazard area in times of impending flood or when advised to do so by the Police or Fire Departments.
6. Turn off all electric circuits at the fuse panel or disconnect switch. If this is not possible, turn off or disconnect all electrical appliances. Shut off the water service and gas valves in your home.

PROPERTY PROTECTION MEASURES

There are various actions that can be taken to flood proof structures. Electrical panel boxes, furnaces, water heaters, and washers/dryers should be elevated or relocated to a location less likely to be flooded. Basement floor drains and interior and exterior backwater valves can be installed and interior floodwalls can be placed around utilities.

If flooding is likely, and time permits, move essential items and furniture to the upper floors of your home. Keep materials like sandbags, plywood, plastic sheeting and lumber handy for emergency waterproofing. This action will help minimize the amount of damage caused by floodwaters. Locations for Emergency Sandbags are listed on the back of this Flyer.

References on flood proofing or retrofitting are available at the Long Beach Main Library, 101 Pacific Avenue, at (562) 570-7500. For assistance on acquiring a flood proofing permit contact the Long Beach Planning & Building Department at (562) 570-6651.

FLOOD PLAIN DEVELOPMENT REGULATIONS

Always check with the City Planning and Building Department before you build on, alter, re-grade, or fill on your property. A permit is needed to ensure that projects do not cause problems on other properties. All new developments, or any alterations, additions, or a modification to your building or land requires a permit from the City's Planning and Building Department. Even re-grading or filling in the flood plain requires a permit. If you see building or filling without a City permit sign posted, contact the Planning and Building Department.

MAINTENANCE OF DRAINAGE SYSTEMS

Long Beach has a complex storm drainage system which is composed of streets and gutters catch basins, underground pipes, ditches, streams, creeks, pump stations and channels/rivers. This system is utilized to carry storm waters away from homes and businesses to drainage areas, such as the Los Angeles and San Gabriel Rivers. Maintenance of this drainage system is very important so that a high flood flow capacity can be realized. To aid in this, the City of Long Beach performs maintenance work on the system at least two times a year. Work is also performed on an emergency basis as needed.

A plugged drainage system cannot carry water and could cause flooding when it rains. Do not dump or throw anything into the street or storm drainage system. Dumping in our streets or drainage system is in violation of Los Angeles County Ordinance 20.94.040 and Long Beach Municipal Code Section 8.60.

If you see dumping or debris in the storm drainage system, contact the Los Angeles County Public Works Department's 24-Hour Storm Drain Hotline Number 1-(800) 303-0003.

FLOOD WARNING SYSTEM

Long Beach has developed a Multi-Hazard Functional Plan (MHFP) to prepare for a variety of disasters, including flooding. The flood warning system included in the MHFP is intended to provide at least one-hour advance warning of a flood hazard.

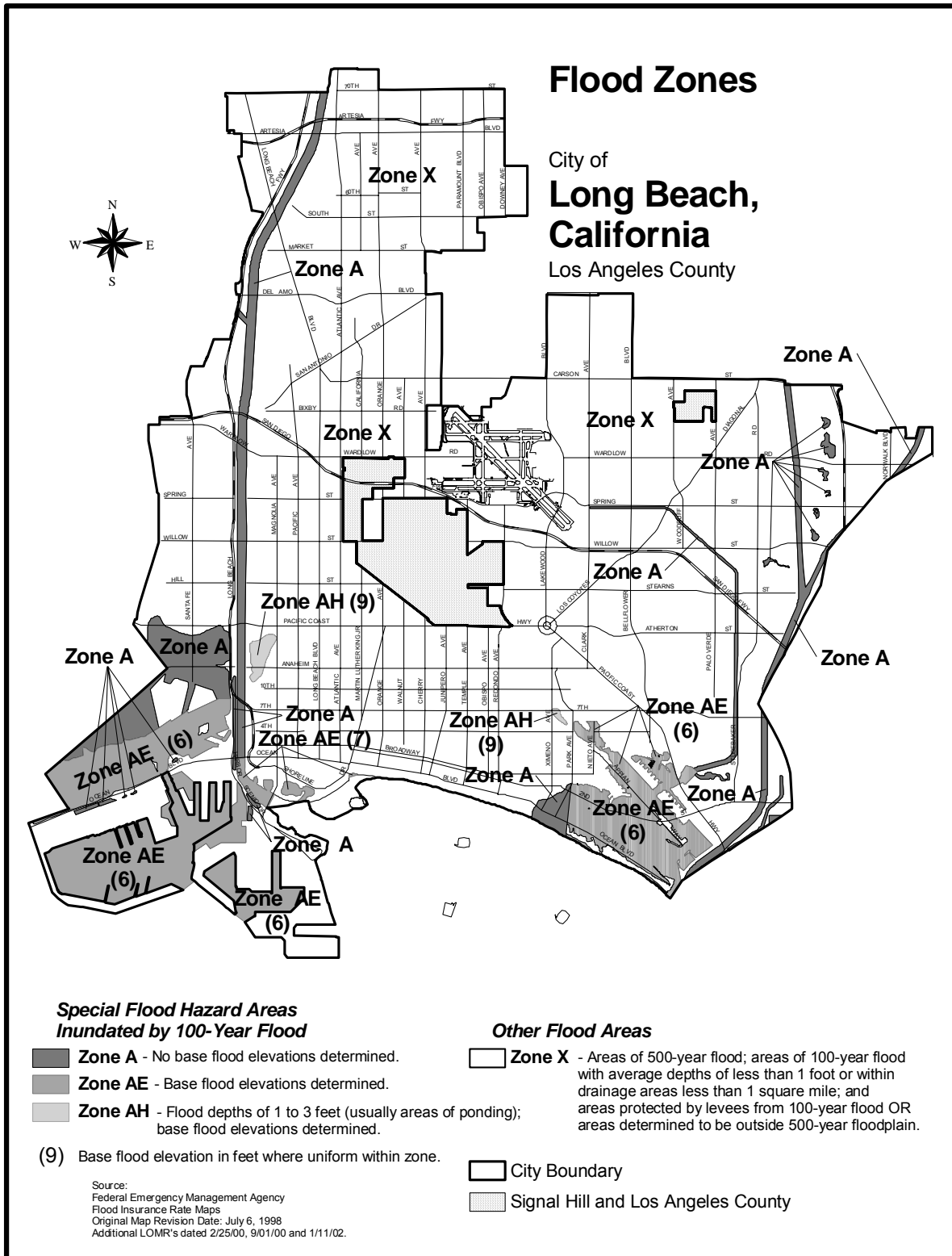
Flood watches (when conditions are right for flooding) and **flood warnings** (flooding is imminent) will be issued to the public by one or all of the following means:

- ☐ Local Cable Network
- ☐ TV (Emergency Broadcast System)
- ☐ Radio (Emergency Broadcast System)
- ☐ Mobile Public Address capabilities of Police cars and helicopters
- ☐ Critical facilities will receive notification by telephone.

FLOOD HAZARD AREAS

Special Flood Hazard Area Map. The following map shows the 100-year flood plain as it appears on the Federal Emergency Management Agency's (FEMA) adopted Flood Insurance Rate Maps (FIRMs) now in effect. Properties that are not currently shown in a flood plain may be included in the future as FEMA revises the FIRMs. To find out if your property is currently in a Special Flood Hazard Area, more detailed maps are on file at the following location:

City Hall
Public Works – Technical Records
333 W. Ocean Blvd., 10th Floor
Long Beach, CA 90802
(562)-570-6784



EMERGENCY PREPAREDNESS RECOMMENDATIONS

Earthquakes strike suddenly, violently and without warning. Identifying potential hazards ahead of time and advance planning can reduce the dangers of serious injury or loss of life from an earthquake.

BEFORE: CHECK FOR HAZARDS IN THE HOME

- Fasten shelves securely to walls.
- Place large or heavy objects on lower shelves.
- Store breakable items such as bottled foods, glass, and china in low, closed cabinets with latches.
- Hang heavy items such as pictures and mirrors away from beds, couches, and anywhere people sit.
- Brace overhead light fixtures.
- Repair defective electrical wiring and leaky gas connections. These are potential fire risks.
- Secure a water heater by strapping it to the wall studs and bolting it to the floor.
- Repair any deep cracks in ceilings or foundations. Get expert advice if there are signs of structural defects.
- Store weed killers, pesticides, and flammable products securely in closed cabinets with latches and on bottom shelves.

IDENTIFY SAFE PLACES IN EACH ROOM

- Under sturdy furniture such as a heavy desk or table.
- Against an inside wall.
- Away from where glass could shatter around windows, mirrors, pictures, or where heavy bookcases or other heavy furniture could fall over.

LOCATE SAFE PLACES OUTDOORS

- In the open, away from buildings, trees, telephone and electrical lines, overpasses, or elevated expressways.
- Make sure all family members know how to respond after an earthquake.
- Teach all family members how and when to turn off gas, electricity, and water.
- Teach children how and when to call 9-1-1, police, or fire department and which radio station to tune to for emergency information.

HAVE DISASTER SUPPLIES ON HAND

- Flashlight and extra batteries
- Portable battery-operated radio and extra batteries
- First aid kit and manual
- Emergency food and water
- Non electric can opener
- Essential medicines
- Cash and credit cards
- Sturdy shoes

Develop an emergency communication plan. In case family members are separated from one another during an earthquake (a real possibility during the day when adults are at work and

children are at school), develop a plan for reuniting after the disaster. Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, it's often easier to call long distance. Make sure everyone in the family knows the name, address, and phone number of the contact person.

DURING: IF INDOORS:

- Take cover under a piece of heavy furniture or against an inside wall and hold on.
- Stay inside.
- The most dangerous thing to do during the shaking of an earthquake is to try to leave the building because objects can fall on you.

DURING: IF OUTDOORS:

- Move into the open, away from buildings, streetlights, and utility wires.
- Once in the open, stay there until the shaking stops.

DURING: IF IN A MOVING VEHICLE:

- Stop quickly and stay in the vehicle.
- Move to a clear area away from buildings, trees, overpasses, or utility wires.
- Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.

PETS AFTER AN EARTHQUAKE:

- The behavior of pets may change dramatically after an earthquake. Normally quiet and friendly cats and dogs may become aggressive or defensive. Watch animals closely. Leash dogs and place them in a fenced yard.
- Pets may not be allowed into shelters for health and space reasons. Prepare an emergency pen for pets in the home that includes a 3-day supply of dry food and a large container of water.

AFTER: BE PREPARED FOR AFTERSHOCKS:

- Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.
- Help injured or trapped persons. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
- Listen to a battery-operated radio or television for the latest emergency information.
- Remember to help your neighbors who may require special assistance-infants, the elderly, and people with disabilities.
- Stay out of damaged buildings. Return home only when authorities say it is safe.
- Use the telephone only for emergency calls.
- Clean up spilled medicines, bleaches or gasoline or other flammable liquids immediately. Leave the area if you smell gas or fumes from other chemicals.
- Open closet and cupboard doors cautiously.
- Inspect the entire length of chimneys carefully for damage. Unnoticed damage could lead to a fire.

INSPECTING UTILITIES IN A DAMAGED HOME

- Check for gas leaks. If you smell gas or hear blowing or hissing noise, open a window and quickly leave the building. Turn off the gas at the outside main valve if you can and call the gas company from a neighbor's home. If you turn off the gas for any reason, a professional must turn it back on.
- Look for electrical system damage. If you see sparks or broken or frayed wires, or if you smell hot insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice.
- Check for sewage and water line damage. If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap. You can obtain safe water by melting ice cubes.

MITIGATION

Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in preventive mitigation steps now, such as repairing deep plaster cracks in ceilings and foundations, anchoring overhead lighting fixtures to the ceiling and following local seismic building standards will help reduce the impact of earthquakes in the future. For more information on mitigation, contact your local emergency management office.

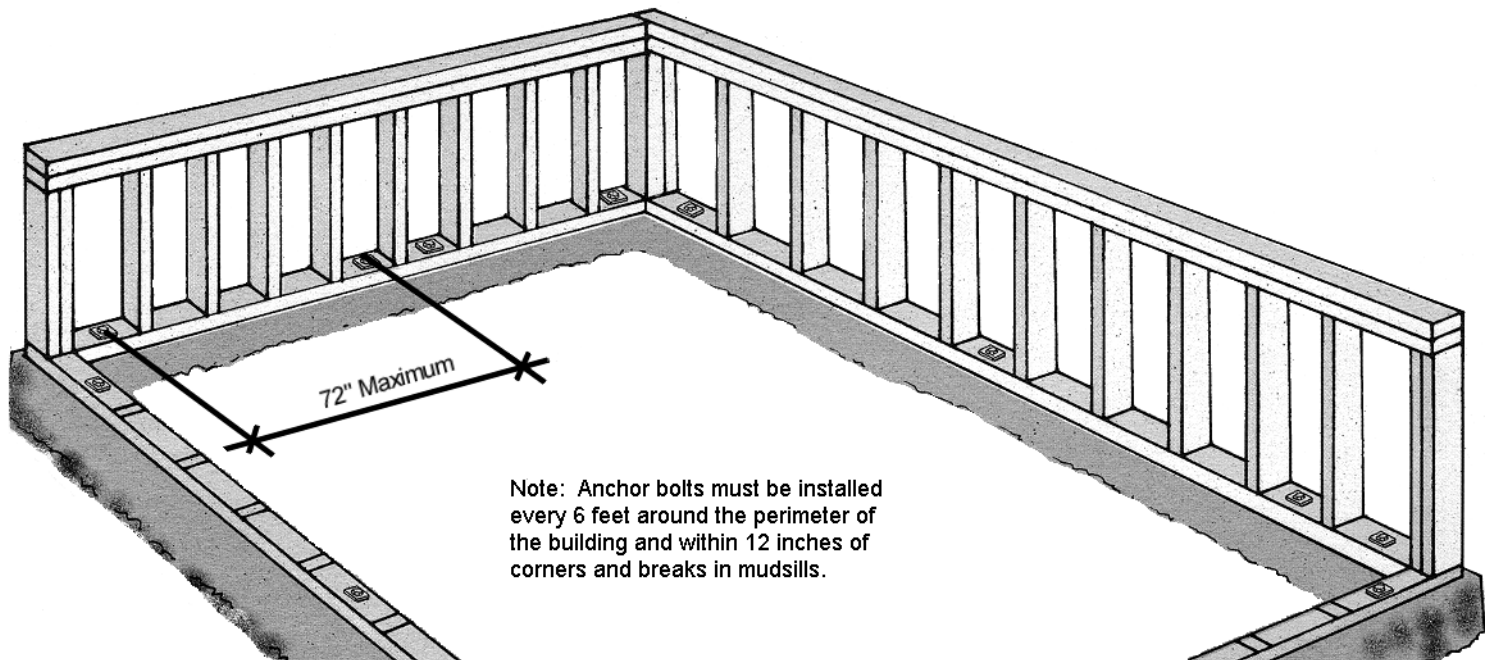
IS YOUR HOUSE BOLTED DOWN?

What To Look For: The place to start is in the crawl space under your home. The wood 2 by 4 or 2 by 6 that rests directly on the foundation is called the “mudsill”. The mudsill should be bolted at 6-foot intervals, and a bolt should be located within 12 inches of every joint, step and corner in the mudsill, but no closer than 4 inches from the end of the board. A minimum of 2 anchor bolts is required per board. If the mudsill is not bolted, or not bolted in this manner, the building is not properly attached to the foundation.

Cripple Walls: Check to make sure your cripple walls are braced with plywood to resist lateral movement. Even if your cripple walls have cross bracing, they are not strong enough for earthquakes unless you add plywood.

Check For Faulty Materials: The foundation is a common area of structural weakness, so check the foundation to assure it is in sound condition. Sometimes the concrete used in foundations is too porous and crumbly to provide adequate strength. If so, the building is subject to earthquake damage, even if it has been bolted down and the cripple walls have been reinforced with plywood. If the foundation is unsound, contact a licensed engineer or professional contractor for adequate repair materials and methods.

Cost: Anchor bolts cost as little as \$2.00 each so the perimeter of an average size home can be bolted down for a couple of hundred dollars plus labor. You can obtain a permit and do the work yourself. Utilize the details on the next few pages to help you in installing anchor bolts and plywood on cripple walls.



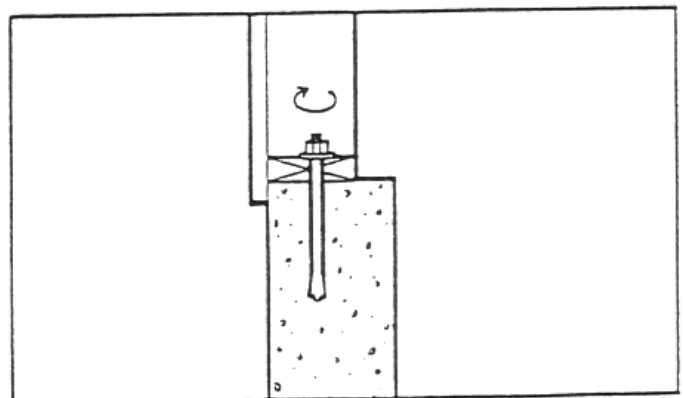
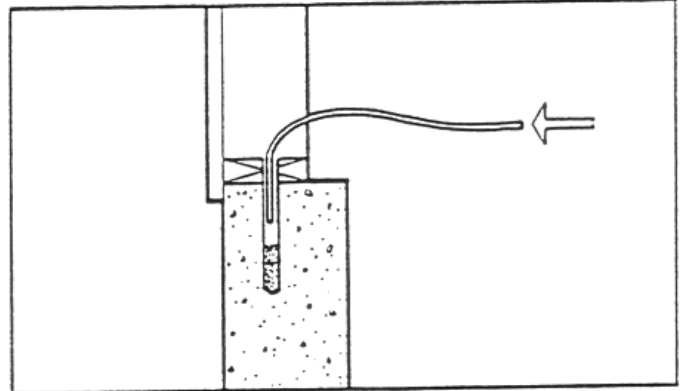
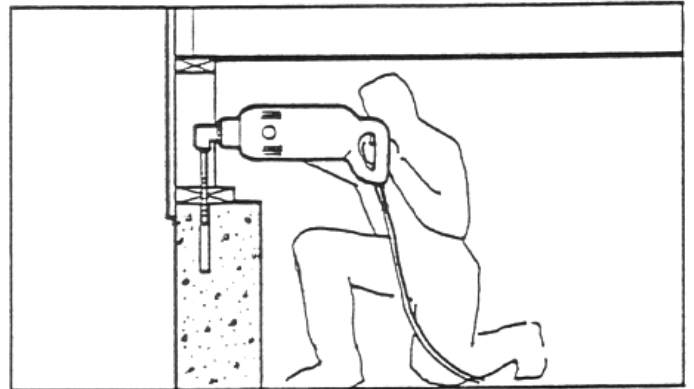
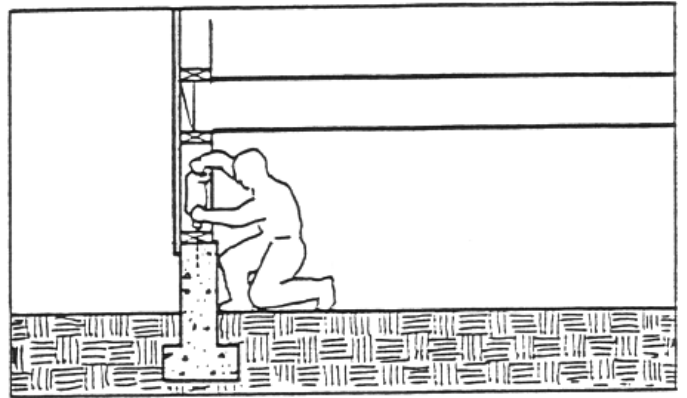
TYPICAL FOUNDATION BOLT INSTALLATION

Follow the guidelines below for bolting a building to a concrete foundation. Make sure that the mudsill and concrete stem wall are in sound condition capable of receiving foundation bolts.

Drill The Holes: Drill holes through the mudsill into the concrete stem wall at least 9 inches using a rotary hammer equipped with a carbide tip concrete drill bit of the proper size.

Clean The Holes: After drilling the holes, remove all concrete dust from the holes. This can be accomplished by using a flexible tube to gently blow the concrete dust out of the holes. (This is especially important if you are using epoxy method bolting)

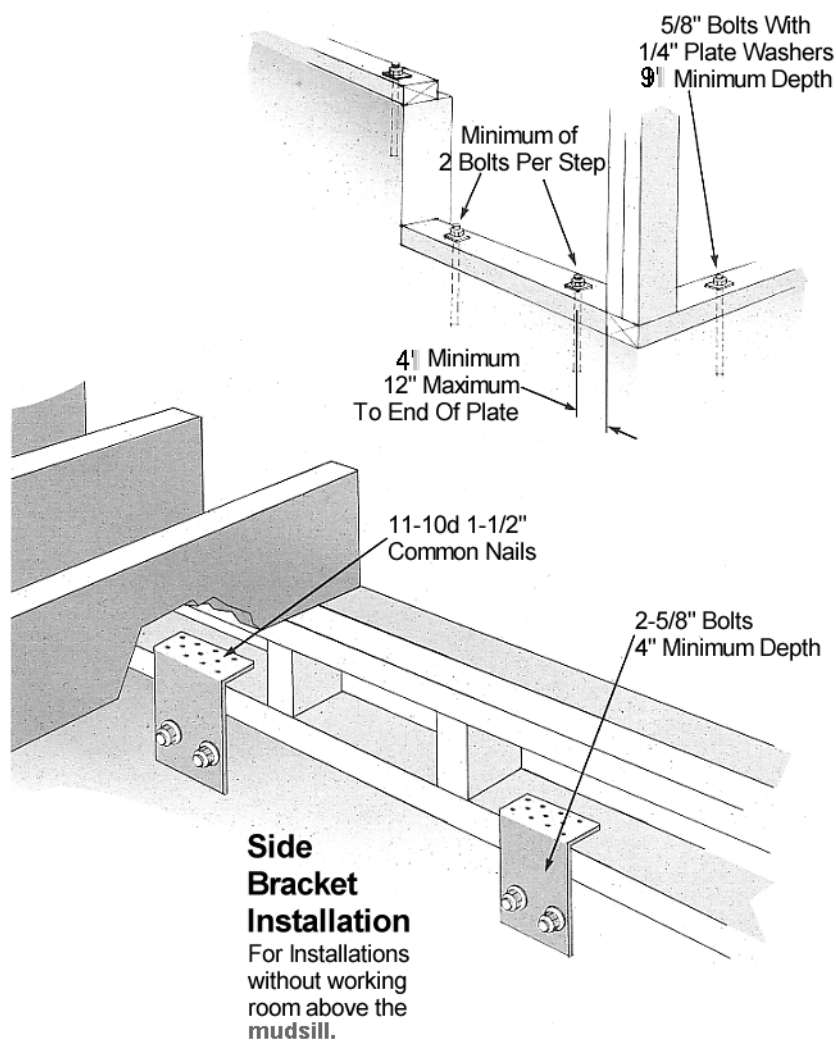
Installing The Bolts: Expansion bolts are designed to be hammered into place. This can be done without damaging the bolt's threads by turning the washer and nut past the end of the bolt and tapping on the end of the bolt shaft to hammer the assembly into place. Once the bolt is in place, tighten the nut down firmly.



TYPICAL BOLT DOWN FOR STEP FOUNDATION AND **SIDE BRACKET**

Stepped Foundation: If your house is built on a hill or even a slight grade, you may have some step like offsets in your foundation. On every step the mudsill must be bolted down.

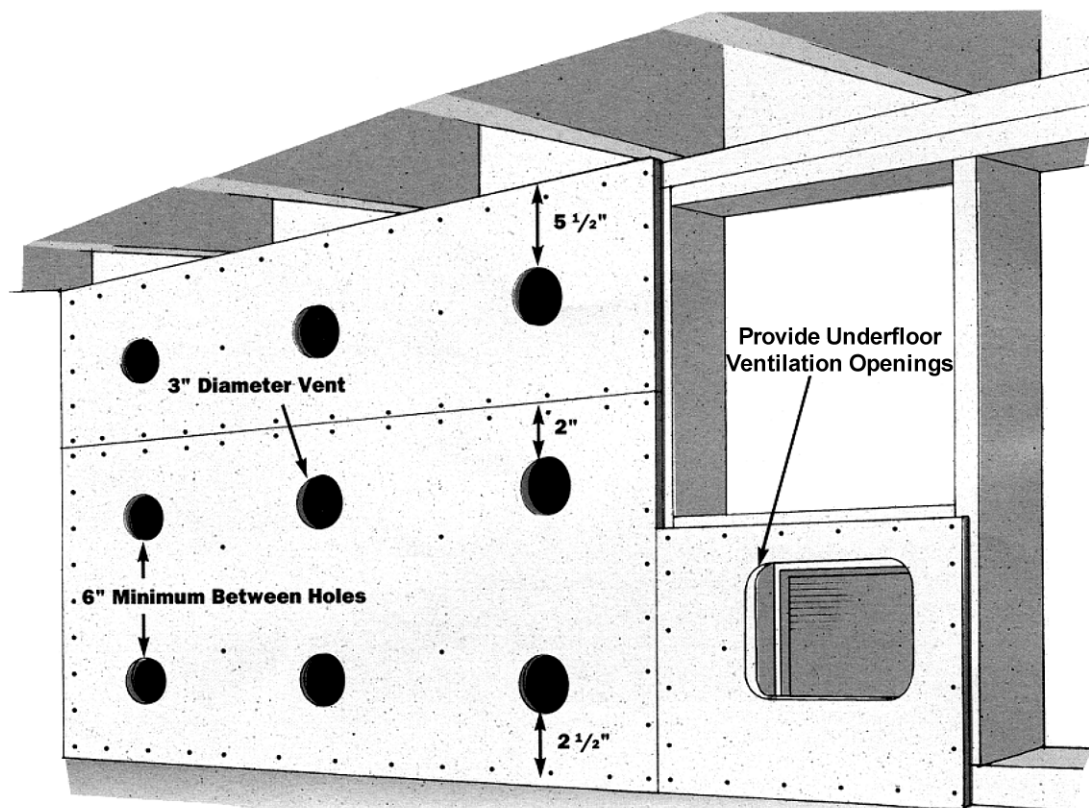
Side Brackets: If working room is limited above the mudsill to drill down, you may secure the mudsill to the foundation with side brackets. This is a manufactured product which is "Listed" and approved for this application. Side brackets may only be used where the mudsill and foundation stem wall concrete are in sound condition capable of receiving nails and bolts. Follow the manufacturers installation instructions.



REINFORCED CRIPPLE WALLS WITH PLYWOOD

Bolts Are Not Enough: Even though your house is bolted to its foundation the lateral forces of an earthquake can make the weakest part of your house (typically the cripple walls) buckle and collapse. Plywood sheets, normally $\frac{1}{2}$ inch in thickness, should be nailed to the cripple walls on all sides of your house. These sheets create shear panels that give the house lateral strength. Old-fashioned 2 by 4 or 2 by 6 cross braces and horizontal braces are not strong enough during a strong earthquake.

1. **How Much and Where:** For a single story house, you should add plywood to at least $\frac{1}{3}$ of each wall length. For a 2-story house, you should reinforce at least $\frac{1}{2}$ of each wall length. Distribute the plywood evenly along the cripple walls using sheets no shorter than 4 feet. Larger sheets, long enough to evenly cover the spaces between the cripple wall studs, should be used whenever possible.
2. **Blocking:** Blocking provides an even nailing surface for each plywood edge. Often the mudsill is embedded into the concrete foundation too deeply to allow nailing along its edge. If so, you will need to add pieces of 2 by 4 or 2 by 6 blocking on top of the mudsill to provide a nailing surface. To prevent dry rot or termite damage, use pressure treated wood for the blocking.
3. **Nailing:** Whether you use a nail gun or a hammer, nails are a critical part of effective bracing. Each sheet of plywood must be nailed every 4 inches around the edges and every 12 inches along all interior cripples and cross braces with 8d nails.
4. **Ventilation Holes:** Drill 3-inch ventilation holes in each sheet. These holes should be centered between each set of studs and 2-1/2 inches above the mudsill and 2-1/2 inches below the bottom of the plates. See illustration below.



BUILDING CODE REQUIREMENTS

WEATHER PROTECTION

All weather-exposed surfaces shall have a weather resistive barrier to protect the interior wall coverings. Such barrier shall be minimum Grade D felt paper. Grade D felt shall be free from holes and breaks and shall be applied over studs of exterior walls in weatherboard fashion. Grade D felt shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches horizontally. Where vertical joints occur, felt paper shall be lapped not less than 6 inches. When felt or paper is applied over wood base sheathing, a minimum of two layers of grade D paper is required. Balconies, landings, exterior stairways, occupied roofs and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of ¼ unit vertical in 12 units horizontal for drainage.

EXTERIOR WALL COVERINGS

A variety of exterior finishes that may be attached to exterior wood studs are available. Of these materials, the most generally used are masonry veneer, wood siding and cement stucco. **See “Typical Lath and Exterior Plaster Detail” on page 66** for installation requirements for stucco exterior finish. For all other exterior finishes contact the Building Bureau for details.

INTERIOR WALL COVERINGS

Interior finishes on wood stud walls vary depending on what your requirements are. In residential design, interior lath and plaster, drywall, and wood paneling or siding are most commonly used. When drywall is used as a base for tile or wall panels for tub, shower or water closed compartment walls, water-resistant drywall backing board (green board) shall be used. Water-resistant drywall may be installed on ceilings where the framing members do not exceed 12 inches on center. **(See Typical Drywall Installation Detail on page 67.)**

SAFETY GLASS

Glazing subject to human impact or installed in hazardous locations shall be safety glazing. A permanent label that specifies that safety-glazing materials have been used shall identify each light of safety glazing material installed in hazardous locations. Hazardous locations are defined as follows:

- ☐ Glazing in ingress and egress doors except jalousies.
- ☐ Glazing in fixed and sliding panels of sliding door assemblies and panels in swinging doors.
- ☐ Glazing in storm doors.
- ☐ Glazing in unframed swinging doors.
- ☐ Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers. Glazing enclosing these compartments shall be safety glazing where the bottom-exposed edge of the glazing is less than sixty inches (60) above a standing surface and drain inlet.
- ☐ Glazing in fixed or operable panels adjacent to a vertical door jamb where the nearest exposed edge of the glazing is within a 24 inch arc and where the bottom edge is less than 60 inches above the walking surface.
- ☐ Glazing in individual fixed or operable panels where the following four conditions exist:
 1. Exposed area of an individual pane greater than 9 square feet.
 2. Exposed bottom edge less than 18 inches above the floor.
 3. Exposed top edge greater than 36 inches above the floor.

4. One or more walking surfaces within.
- ☐ Glazing in railings regardless of height.
 - ☐ Glazing in walls and fences used as a barrier for swimming pools and spas where the glazing is less than 60 inches above the pool deck and within 5 feet of the poolside.
 - ☐ Glazing in walls enclosing stairway landings or within 5 feet of the bottom and top of stairways where the bottom edge of the glass is less than 60 inches above a walking surface.

SKYLIGHTS

When approved plastic skylights are installed, follow the manufacturers installation instructions provided with the assembly. When glass skylights are installed, annealed, high-strengthened or tempered glass skylights shall be equipped with screens substantially supported below the skylight. Screens shall be of non-combustible materials, shall have a mesh not larger than 1 inch by 1 inch, and shall be constructed of not lighter than 12 B & S gauge material.

WINDOWS

Light: All rooms within a dwelling unit shall be provided with natural light by means of exterior glazed openings with an area not less than 1/10 of the floor area of such rooms with a minimum of 10 square feet. The exceptions to this requirement are kitchens and bathrooms that may be provided with artificial light.

Ventilation: All rooms within a dwelling unit shall be provided with natural ventilation by means of openable exterior openings with an area of not less than 1/20 of the floor area of the room with a minimum of 5 square feet. Bathroom and toilet rooms shall have an aggregate window area of not less than one-twentieth of the floor area served, and with not less than 1-1/2 square feet of openable window area, or be provided with artificial light and mechanical ventilation.

Emergency Egress Windows and Doors: Every sleeping room below the fourth floor shall have at least one openable window or door to the outside to permit emergency exit or rescue. The emergency door or window shall be openable from the inside to provide a full, clear opening without the use of separate tools. Windows shall have a sill height of not more than 44 inches above the floor. Windows shall comply with all the following three conditions:

1. Provide not less than 5.7 square feet of clear openable area.
2. Provide a net clear opening width of not less than 20" and;
3. Provide a net clear height of not less than 24".

(See "Emergency Escape and Rescue Window" detail on page 61.)

Security Bars: Security bars may be installed on emergency escape and rescue windows provided the security bars are equipped with approved release mechanisms which are openable from the inside without the use of a key or special knowledge or effort.

SIZE OF ROOMS

Every dwelling unit shall have at least one room that shall have not less than 120 square feet of floor area. Other habitable rooms within the structure used for living, sleeping, or eating, except kitchens, shall have an area of not less than 70 square feet with no dimension less than 7 feet in any direction.

No habitable room except kitchens shall be less than 7 feet in any dimension. A toilet space shall not be less than 30 inches in width and shall have a clear space in front of toilet of at least 24 inches.

CEILING HEIGHT

Habitable space shall have a ceiling height of not less than 7 feet 6 inches. Kitchens, halls, bathrooms and toilet compartments may have a ceiling height of not less than 7 feet. In rooms with sloping ceilings, the required ceiling height shall be provided in at least 1/2 of the room and no portion of any room having a ceiling height of less than 5 feet shall be considered as contributing to the minimum area required.

ATTIC ACCESS OPENINGS

Attic access openings shall be provided to attics when the minimum vertical height of the attic is 30 inches or greater. The opening shall not be less than 22 inches by 30 inches. An attic in which a warm-air furnace is installed shall be accessible by an opening and passageway as large as the largest piece of equipment but not smaller than 30 inches by 30 inches.

ROOFING

Roof coverings shall be secured or fastened to the supporting roof construction and shall provide weather protection for the building at the roof. Choose a type and grade of roofing suitable for the building. Entering into the choice are such elements as the occupancy of the building, the slope of the roof, local weather conditions, and its design, style and size. ***(See “Asphalt Shingle Application” detail on page 63, “Asphalt Shingle Re-Roof” detail on page 64 and “Wood Shake and Shingle Application” detail on page 65.)***

ROOF FLASHING

All penetrations through a roof structure shall be properly flashed with roof jacks or other approved flashing in such a manner as to make them weatherproof. Such projections through the roof are plumbing vents, heating vents, skylights, electrical service risers, fireplace chimney and other similar penetrations.

All wall to roof intersections shall have 1" x 4" backing installed for "Z" Bar flashing. Step counter flashing shall be installed where the "Z" Bar flashing slopes with the roof. "L" metal counter flashing shall be installed where the roof slopes away from the "Z" Bar flashing.

ATTACHED GARAGE

A private garage attached to a dwelling shall have materials as approved for one-hour-fire-resistive construction on the garage side of any common wall and extending to the roof. Any doorway into the house shall have a self-closing, tight fitting solid wood door of not less than 1-3/8 inches in thickness. Such a door cannot open into a sleeping room. Garage floor surfaces shall be of non-combustible materials or asphaltic paving materials. The walls and ceilings of a private garage that has rooms above shall be of one-hour fire-resistive construction. The pilot, burner and flame of all heating and cooling equipment in the garage must be elevated 18 inches above the floor.

STAIRWAYS

1. **Width:** Private residential stairways shall not be less than 36 inches in width.
2. **Rise and Run:** The rise of steps for private residential stairways shall not be less than 4 inches or greater than 8 inches. The run of steps shall not be less than 9 inches. The largest tread run or riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch.
3. **Winding Stairways:** In private stairways, tread winders may be used if the required width of the run is provided at a point not more than 12 inches from the side of the stairway where the treads are narrower, but in no case shall any width of run be less than 6 inches at any point.
4. **Landings:** Every landing shall have a dimension measured in the direction of travel not less than the width of the stairway or 36 inches in private stairways. Stair runs may not be more than 12 feet vertically between landings or floors
5. **Handrails:** Stairways shall have a handrail on at least one side when the stairway is less than 44 inches in width and serving one individual dwelling. The top of handrails shall be located at least 34" inches and not more than 38" inches above the nosing of the tread and landings. The handgrip portion of handrails shall not be less than 1-1/4 inches and not more than 2 inches. The handrail may project not more than 3-1/2 inches into the required width of the stairway. Handrail ends shall return to a wall or newel post. *(See "Typical Guardrail and Handrail Detail" on page 68.)*
6. **Openings:** Open handrails and guardrails shall have intermediate rails or an ornamental pattern such that a sphere 4 inches in diameter cannot pass through.
7. **Headroom Clearance:** Every stairway shall have a headroom clearance of not less than 6 feet 8 inches. Such clearances shall be established by measuring vertically from a plane parallel and tangent to the stairway tread nosing to the soffit above at all points.

STEPS AT DOORS

A landing shall be provided on each side of the doorway with the threshold elevation change not exceeding 1" inch. For doors serving the physically disabled, the maximum threshold elevation change shall be 1/2 inch. Landings shall have a dimension measured in the direction of travel equal to the width of the stairway. A door may open at the top step of an interior flight of stairs, provided the door does not swing over the top step. A door may open at a landing that is not more than 8 inches lower than the floor level provided the door does not swing over the landing.

SMOKE DETECTORS

Every new dwelling shall be provided with smoke detectors. The detector shall be mounted on the ceiling or wall at a point centrally located in the corridor or area giving access to rooms used for sleeping purposes, and in every sleeping room. The detectors shall receive their primary power from the building wiring and be interconnected so when a detector is activated it shall cause all the detectors to sound their alarms. Interior alterations, repairs, or additions requiring a permit and having a valuation in excess of \$1,000, or when one or more sleeping rooms are added or created, the entire dwelling shall be provided with detectors located as required for a new dwelling. The detectors may be battery operated when installed in existing buildings, and are not required to be interconnected.

FOUNDATION REQUIRED

Exterior walls and interior bearing walls shall be supported on continuous masonry or concrete walls or footings. Foundations supporting wood shall extend at least 6 inches above the adjacent finish grade. Interior bearing walls in one-story buildings may be supported on piers, 14 inches by 14 inches, shall extend at least 8 inches into the natural ground and project not less than 8 inches above finish grade. Where expansive (adobe) soils, filled ground or steep hillsides exist, consult the Building and Safety Bureau for special foundation requirements. **(See *Typical Dwelling Details* on pages 56 and 57.)**

FOUNDATION PLATES - MUDSILLS

Foundation plates shall be foundation grade redwood or approved pressure-treated wood, marked or branded by an approved agency. The minimum size shall be 2 inches in thickness by the full width of the studs. Sills must be placed under all walls or partitions that rest on concrete or masonry.

Foundation plates or sills shall be bolted to the foundation wall with not less than **5/8 inch diameter bolts** embedded 7 inches into the masonry or concrete and spaced not more than 6 feet apart, nor more than 12 inches from an end of the sill or corner. A **¼"x 2-1/2"x 2-1/2" square washer** and nut shall be tightened on each bolt to the plate. There shall be a minimum of two bolts per piece of mudsill or foundation plate.

CLEARANCE OF BUILDINGS ABOVE GROUND AND VENTILATION

Minimum clearance between the bottom of floor joists or bottom of floors without joists and the ground below shall be 18 inches. Minimum clearance under girders shall be 12 inches.

The space between the bottom of floor joists and the ground of any building shall be provided with a sufficient number of ventilation openings through foundation walls or exterior walls to ensure ample ventilation, and such openings shall be covered with a corrosion-resistant wire mesh having one-quarter inch openings. Openings shall be arranged to provide cross ventilation, and shall have a net area of not less than 1 square foot for each 150 square feet of under floor area. See "Ventilation Guide".

JOISTS

All joists shall have a minimum bearing of 1-1/2 inches on wood or metal and 3 inches on masonry. Joists shall be supported laterally at the ends and each support by solid blocking except where the ends of joists are nailed to a header, band or rim joist or to an adjoining stud or by other approved means. Solid blocking shall be 2-inch nominal thickness and the full depth of the joist. All joists under and parallel to bearing partitions shall be doubled and well spiked. Trimmer and header joists shall be doubled when the span of the header exceeds 4 feet. The ends of header joists over 6 feet long, and tail joists over 12 feet long, shall be hung in joist or beam hangers. Trimmers and header joists more than 4 feet long shall be doubled. Joists, beams, and wood framing shall not be placed closer than 2 inches of fireplaces, smoke chambers, or chimneys. **(See *Typical Floor Framing Detail* on page 53.)**

STUD WALLS AND PARTITIONS

Studs shall be placed with their wide dimension perpendicular to the wall. Not less than 3 studs shall be installed at each corner of each exterior wall. Bearing partitions and exterior walls shall be constructed of not less than 2 x 4 inch studding not more than 16 inches on center. Bearing and exterior wall studs shall be capped with double top plates installed to provide overlapping at corners and at intersections with other partitions. End joints in double top plates shall be offset at least 48 inches.

All openings 4 feet wide or less in bearing walls shall be provided with headers equivalent to double headers not less than 2 inches thick, placed on edge, securely fastened together. All openings more than 4 feet wide shall be provided with headers of sufficient size to support the load. Such headers shall have not less than 1-1/2 inches solid bearing at each end to the floor or bottom plate.

Where plumbing, heating, or other pipes are placed in a partition necessitating the cutting of the plates, a metal tie of not less than 1/8 inch thick and 1-1/2 inches wide shall be fastened to the plate across to each side of the opening with not less than six 16d nails.

All walls shall be fire-stopped with 2-inch material the full width of the studs at the floor, ceilings, and between floor and ceiling at intervals not to exceed 10 feet vertically. Spaces around vents, pipes, ducts, chimneys, fireplaces, and similar openings that afford a passage for fire shall be fire-stopped with non-combustible materials. **(See “Typical Wall Elevation” on page 55.)**

ROOF CONSTRUCTION

There shall be ridge board at least one inch nominal thickness at all ridges and not less in depth than the cut end of the rafter. At all valleys and hips there shall be a valley or hip rafter not less than two inches thick and not less in depth than the cut end of the rafter. Rafters shall be framed directly opposite each other at the ridge and shall be nailed to adjacent ceiling joists at the plate line to form a continuous tie between exterior walls. Where the ceiling joists run other than parallel to the rafters, rafters shall be tied back to the roof framework by means of cross ties spaced not more than 48 inches on center. Such ties shall be not less than 1 by 4 inches.

Purlins to support roof loads may be installed to reduce the span of rafters within allowable limitations and shall be supported by struts to bearing walls. The purlin shall not be smaller than the supported rafter. The maximum span of 2 by 4 inch purlins shall be 4 feet. The maximum span of 2 by 6 inch purlins shall be 6 feet. Struts shall be not smaller than 2 by 4 inches. The unbraced length of struts shall not exceed 8 feet and the slope of the struts shall be not less than 45 degrees from the horizontal. **(See “Typical Dwelling Details” on pages 56 and 57.)**

ENERGY CONSERVATION REQUIREMENTS

A MATTER OF STATE LAW

The oil embargo in the 1970's gave rise to California State adoption of policies and regulations directed to conserving energy. Mandatory energy conservation requirements were imposed on the construction of new residential and commercial buildings, and new additions and alterations to existing buildings. The Long Beach Building and Safety Bureau is responsible for enforcing these State requirements.

NEW BUILDINGS

Over the years, the California energy conservation regulations have been modified several times. For new residential structures, there are several approaches or options for achieving compliance that should be carefully considered. The Standards may be obtained by contacting:

California Energy Commission
Publications, MS-13
P.O. Box 944295
Sacramento, CA 94244-2950
Energy Hot Line: (800) 772-3300 or (916) 654-5106

RESIDENTIAL ADDITIONS AND ALTERATIONS

The State of California Energy Standards affects all new residential buildings, including additions and alterations to existing homes. The following guidelines reflect basic requirements prescribed by the State Energy Commission for additions and alterations. Any deviations from the following guideline must be justified by submission of a point system or computer analysis and appropriate compliance forms.

GENERAL REQUIREMENTS

1. There are two climate zones within the City of Long Beach as determined by state energy laws. The 405 freeway is the dividing line between Climate Zone 6 (CZ6) and Climate Zone 8 (CZ8). Buildings north of the 405 Freeway are in CZ8 and those south of the 405 Freeway are in CZ6. This is important to know because there are differences in the energy law requirements from one zone to the other.
2. Radiant barriers are required for all additions in Climate Zone 8.
3. Insulation and glazing requirements will be determined by submitting energy calculations. (Package D)

The following is required for **additions**:

1. **Insulation**
R-30 in the ceiling
R-19 in the raised floor
None in the slab floor perimeter
R-13 in the exterior wall of the building envelope
Radiant barrier (reflective material) for roofs in CZ8.

2. **Glazing**

Additions up to 100 square feet shall not exceed 50 sq. ft. of glazing. The glazing U-Factor shall not exceed 0.75 and its SHGC (shading factor) shall not exceed 0.40 in CZ8. For additions less than 1000 square feet, glazing area is limited to 20% of the floor area of the addition plus the area of any existing glazing removed because of the addition, all other requirements of Package "D" shall be met. For additions greater than or equal 1000 square feet: All the requirements of Package "D" must be complied with.

PACKAGE "D" REQUIREMENTS

| Component | CZ6 | CZ8 |
|------------------------------------|--------------|--------------|
| Building Envelope | | |
| Ceiling Insulation | R30 | R30 |
| Ceiling Radiant Barrier | Not Required | Required |
| Wood-frame Wall | R13 | R13 |
| Heavy Mass Wall | R2.44 | R2.44 |
| Raised Floor | R19 | R19 |
| Slab Floor Perimeter | Not Required | Not Required |
| Glazing | | |
| Maximum U-factor | 0.75 | 0.75 |
| Maximum Total Area | 20% | 20% |
| Solar Heat Gain Coefficient | Not Required | 0.40 |
| Thermal Mass | Not Required | Not Required |
| Space Heating System | Standard | Standard |
| Space Cooling System | | |
| SEER | Minimum | Minimum |
| TXV | Not Required | Required* |
| Ducts | | |
| Duct Sealing | Not Required | Required* |
| Domestic Water Heater | Standard | Standard |

*In lieu of TXV and duct sealing, either provide in additions, glazing of U-factor equal to 0.4 and SHGC of 0.35 or the installed air conditioning equipment must have a SEER of 12 minimum.

3. **Water Heaters**

An existing water heater can be replaced in a residence, but a new water heater cannot be added. The California Energy Commission shall certify all new water heaters.

4. **Lighting Fixtures**

Lighting fixtures installed for primary general lighting in kitchens and bathrooms shall have an efficiency of at least 40 lumens per watt. (Generally, fluorescent lights satisfy this requirement). Lights must be controlled by the most accessible switch (es) in the kitchen or bath, and be centrally located in the ceiling overhead.

5. **HVAC Systems**

No electric space heating may be installed. Duct insulation must have a minimum R-value of 4.2. Set back thermostats are required for central furnaces and heat pumps.

6. **Duct, Water Heater, & Piping Insulation**

Ducts for heating and/or air conditioning to be insulated per Chapter 6 of the Uniform Mechanical Code. R-12 around the storage type water heater, or labeled (for R-16 internal wrap). R-4 around the hot water outlet pipe from the water heater tank in the conditioned space. This applies to the first five feet of pipe in the unconditioned space.

7. **Infiltration Control**

Doors and windows between conditioned and unconditioned spaces must be weather-stripped. Caulking and sealants must be used in the building envelope around windows and door frames; between wall sole plates and floors; between wall panels, openings in walls, ceilings, and floors for plumbing, electricity and gas lines; openings in attic floors; and all other openings in the building envelope. Automatic back draft dampers must be installed in exhaust duct systems.

8. **Masonry and Factory-Built Fireplaces**

The entire opening of the firebox must be covered with a tight-fitting closeable metal or glass door. The firebox shall have an outside air intake that has minimum area of six square inches. It must also have a tight-fitting damper that is operable and readily accessible. The use of indoor air to cool the firebox when that indoor air is vented to the outside of the building is prohibited. Follow the Manufacturers Installation Instructions.

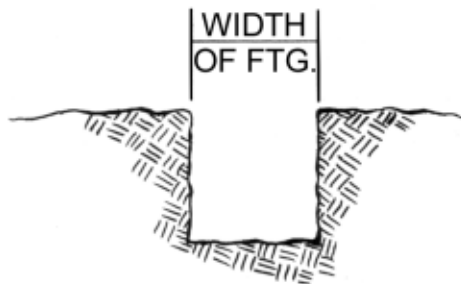
ALTERATIONS

1. Alterations that add fenestration area shall be limited to 0.75 U-factor and SCHG factor of 0.4 in CZ8.
2. New air conditioning units must have TXV and duct sealing or an air conditioning unit of SEER of 12 minimum.

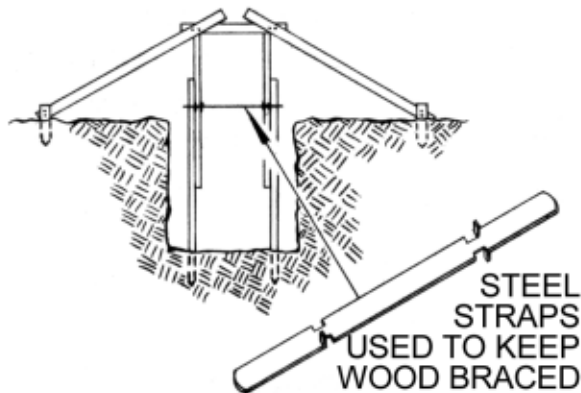
BUILDING DETAILS, DIAGRAMS AND TABLES

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| □ STANDARD SPAN TABLE FOR LIGHT FRAME CONSTRUCTION | Page 52 |
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| □ VENTILATION GUIDE..... | Page 54 |
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| □ TYPICAL DWELLING DETAILS(Crawl hole,purlin and raised floor footing details) .. | Page 56 |
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| □ NOTCHES AND HOLES IN ROOF, CEILING AND FLOOR FRAMING | Page 60 |
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| □ TYPICAL LATH AND EXTERIOR PLASTER DETAIL | Page 66 |
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| □ TYPICAL GUARDRAIL AND HANDRAIL DETAIL..... | Page 68 |
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| □ TYPICAL ATTACHED PATIO COVER DETAILS | Page 70 |
| □ MINIMUM REQUIREMENTS FOR 6" or 8" BLOCK WALL..... | Page 71 |
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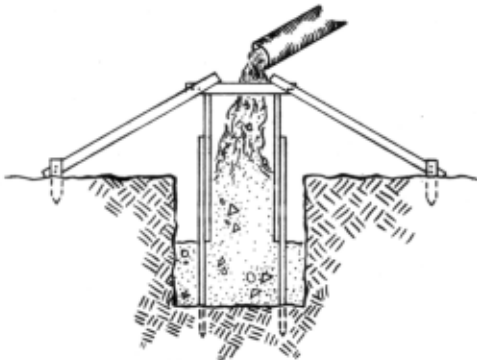
CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL TRENCH DETAIL



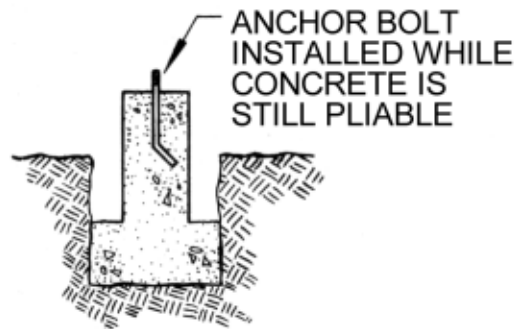
STEP #1 - TRENCH DUG



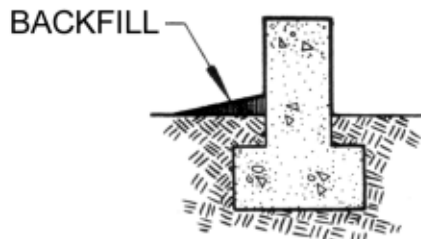
STEP #2 - FORMS PLACED



**STEP #3 - CONCRETE
POURED**



STEP #4 - FORMS REMOVED



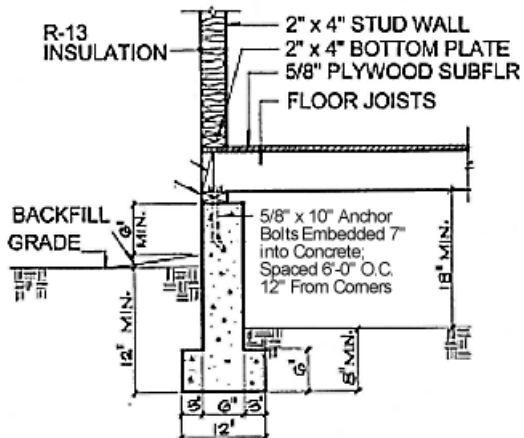
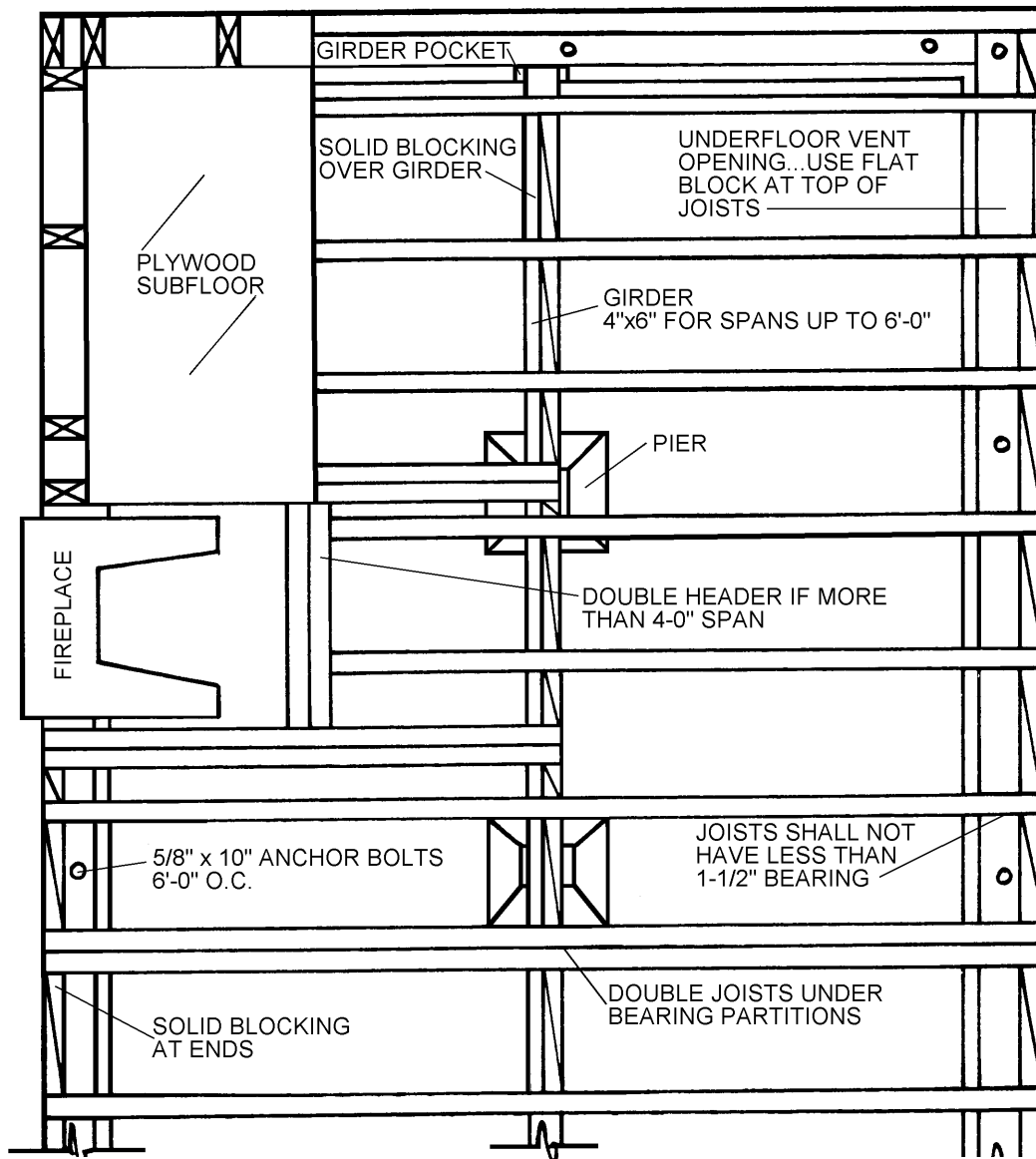
STEP #5 - FILL & BACKFILL

1. Establish location of property lines and conform to all setback requirements on the approved Plot Plan.
2. Dig footings to the prescribed depth and width specified on the plan. Excavation shall be free of debris and roots to 12 inch depth.
3. Install forms. Forms shall result in a final structure that conforms to shape, lines and dimensions of the members as required by the design drawings. Forms shall be substantial and sufficiently tight to prevent leakage. Forms shall be properly braced and tied together to maintain position and shape.
4. Pipe and conduit penetration projecting through the footing or stem wall shall be properly sleeved.
5. All concrete shall be thoroughly consolidated by suitable means during placement and shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
6. All form boards and stakes shall be removed in such a manner not to damage the structure. No wood shall remain in contact with concrete after form removal.

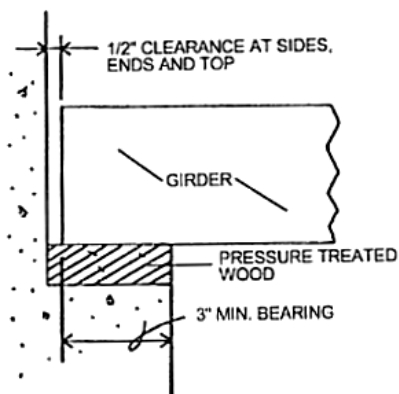
CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
STANDARD SPAN TABLE FOR
LIGHT FRAME CONSTRUCTION

| RAFTER AND JOIST TABLE FOR LIGHT FRAME CONSTRUCTION DOUGLAS FIR-LARCH (STANDARD OR #2) | | | | |
|---|------------------------|---------------------|-----------------------|---------------------|
| SIZE (GRADE) | SPACE (IN.) | FLOOR JOISTS | CEILING JOISTS | ROOF RAFTERS |
| 2" X 4" (#2) | 12 | N/A | 12' 5" | 10' 1" |
| | 16 | N/A | 11' 3" | 8' 9" |
| | 24 | N/A | 9' 10" | 7' 2" |
| 2" X 6" (#2) | 12 | 10' 9" | 19' 6" | 14' 9" |
| | 16 | 9' 9" | 17' 8" | 12' 10" |
| | 24 | 8' 2" | 14' 9" | 10' 5" |
| 2" X 8" (#2) | 12 | 14' 2" | 25' 8" | 18' 9" |
| | 16 | 12' 7" | 23' 2" | 16' 3" |
| | 24 | 10' 4" | 18' 10" | 13' 3" |
| 2" X 10" (#2) | 12 | 17' 9" | N/A | 22' 10" |
| | 16 | 15' 3" | 25' 5" | 19' 10" |
| | 24 | 12' 7" | 22' 11" | 16' 2" |
| 2" X 12" (#2) | 12 | 20' 7" | N/A | N/A |
| | 16 | 17' 11" | N/A | 23' 0" |
| | 24 | 14' 6" | N/A | 18' 9" |

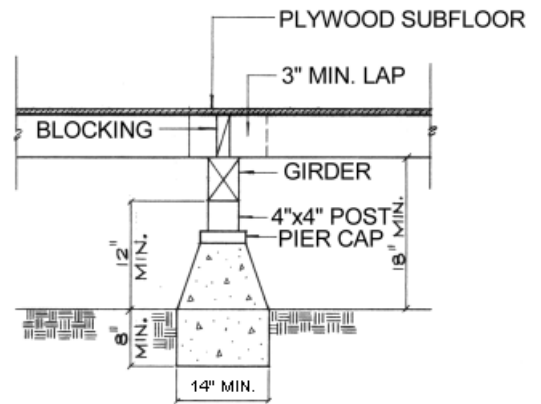
CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING
TYPICAL FLOOR FRAMING DETAIL



EXTERIOR BEARING FOOTING



TYPICAL GIRDER POCKET



TYPICAL PIER DETAIL

CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT

VENTILATION GUIDE

- X Attic Ventilation:
X Under floor Ventilation:

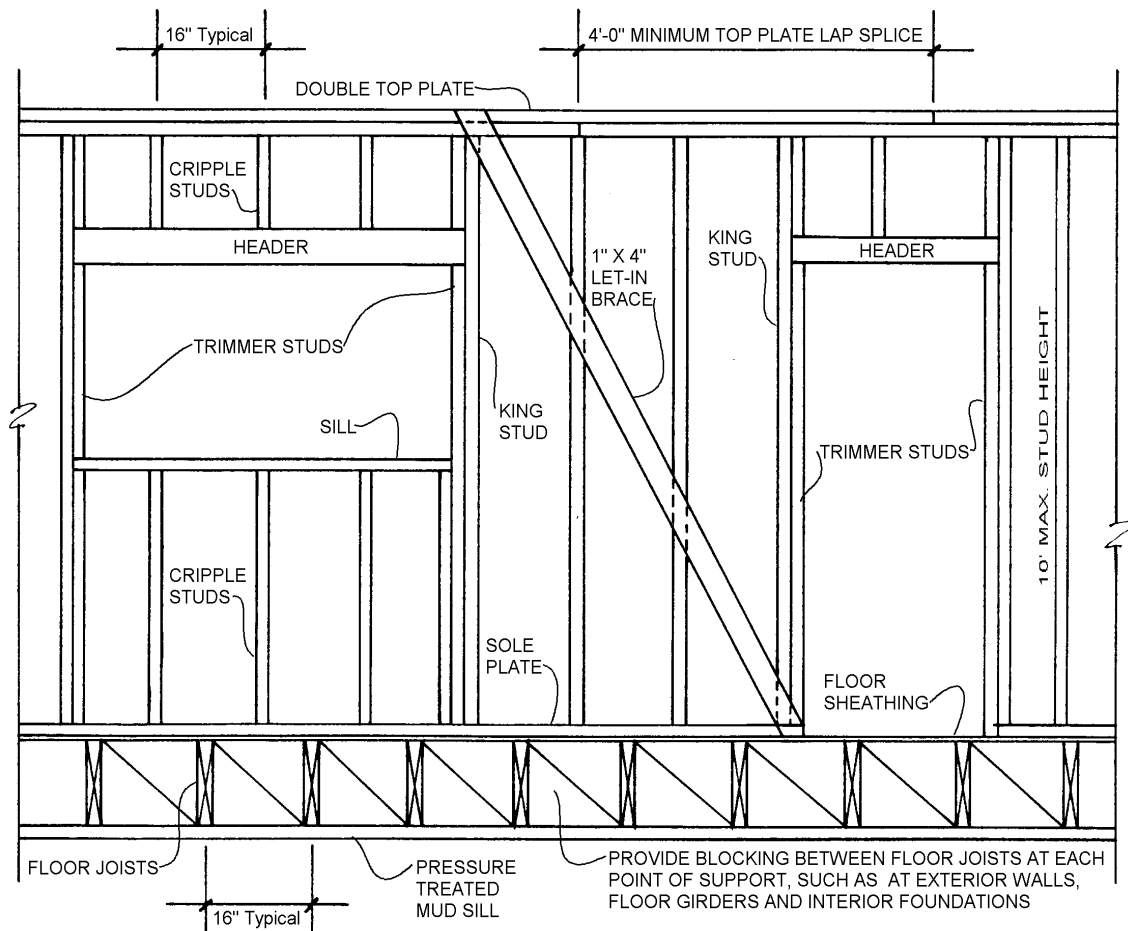
The Uniform Building Code requires enclosed attic spaces, enclosed rafter spaces and under floor areas to be ventilated by not less than 1 square foot for each 150 square feet of attic/under floor area. The chart below represents the net minimum area, in square inches, required for proper ventilation. The minimum *number* of required openings can be determined by dividing the number below by the net clear opening (in square inches) of one opening.

Openings shall be covered with corrosion-resistant metal/wire mesh with mesh openings of 1/4 inch (6.4 mm) in dimension.

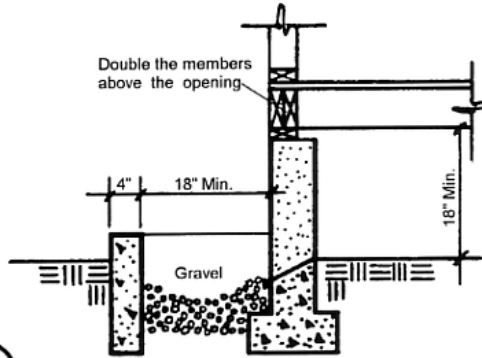
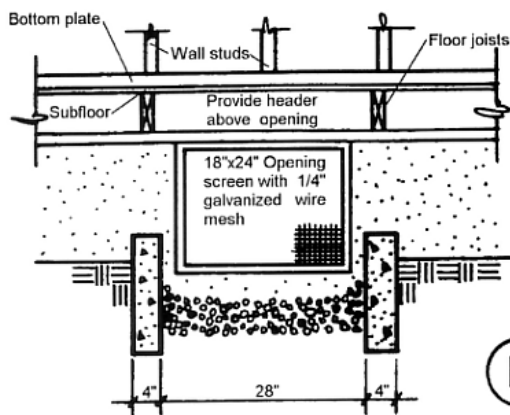
| Length (In feet) | Width (in feet) | | | | | | | | | | | |
|---------------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 |
| 20 | 384 | 422 | 461 | 499 | 538 | 576 | 614 | 653 | 691 | 730 | 768 | 806 |
| 22 | 422 | 465 | 507 | 549 | 591 | 634 | 676 | 718 | 760 | 803 | 845 | 887 |
| 24 | 461 | 507 | 553 | 599 | 645 | 691 | 737 | 783 | 829 | 876 | 922 | 968 |
| 26 | 499 | 549 | 599 | 649 | 699 | 749 | 799 | 849 | 899 | 948 | 998 | 1048 |
| 28 | 538 | 591 | 645 | 699 | 753 | 806 | 860 | 914 | 968 | 1021 | 1075 | 1129 |
| 30 | 576 | 634 | 691 | 749 | 806 | 864 | 922 | 979 | 1037 | 1094 | 1152 | 1210 |
| 32 | 614 | 676 | 737 | 799 | 860 | 922 | 983 | 1044 | 1106 | 1167 | 1229 | 1290 |
| 34 | 653 | 718 | 783 | 849 | 914 | 979 | 1044 | 1110 | 1175 | 1240 | 1306 | 1371 |
| 36 | 691 | 760 | 829 | 899 | 968 | 1037 | 1106 | 1175 | 1244 | 1313 | 1382 | 1452 |
| 38 | 730 | 803 | 876 | 948 | 1021 | 1094 | 1167 | 1240 | 1313 | 1386 | 1459 | 1532 |
| 40 | 768 | 845 | 922 | 998 | 1075 | 1152 | 1229 | 1306 | 1382 | 1459 | 1536 | 1613 |
| 42 | 806 | 887 | 968 | 1048 | 1129 | 1210 | 1290 | 1371 | 1452 | 1532 | 1613 | 1693 |
| 44 | 845 | 929 | 1014 | 1098 | 1183 | 1267 | 1352 | 1436 | 1521 | 1605 | 1690 | 1774 |
| 46 | 883 | 972 | 1060 | 1148 | 1236 | 1325 | 1413 | 1501 | 1590 | 1678 | 1766 | 1855 |
| 48 | 922 | 1014 | 1106 | 1198 | 1290 | 1382 | 1475 | 1567 | 1659 | 1751 | 1843 | 1935 |
| 50 | 960 | 1056 | 1152 | 1248 | 1344 | 1440 | 1536 | 1632 | 1728 | 1824 | 1920 | 2016 |

CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL WALL ELEVATION

| HEADER SIZES | | NAILING SCHEDULE | |
|---|----------|------------------------------------|---------------|
| WIDTH | HEADER | CONNECTION | NAILING |
| 0' TO 4' | *4" X 4" | JOIST TO SILL OR GIRDER, TOENAIL | 3 - 8d |
| 4' TO 6' | 4" X 6" | SOLE PLATE TO JOIST OR BLOCKING | 16d-16" O.C. |
| 6' TO 8' | 4" X 8" | TOP PLATE TO STUD, END NAIL | 2 - 16d |
| 8' TO 10' | 4" X 10" | STUD TO SOLE PLATE, END NAIL | 2 - 16d |
| 10' TO 12' | 4" X 12" | DOUBLE STUDS, FACE NAIL | 16d- 24" O.C. |
| * All openings 4 feet wide or less in bearing walls may be provided with headers consisting of two pieces of 2-inch framing lumber placed on edge and securely fastened together. | | DOUBLE TOP PLATES, FACE NAIL | 16d- 16" O.C. |
| | | DOUBLE TOP PLATE, LAP SPLICE | 8 - 16d |
| | | 1" LET-IN BRACE TO EACH STUD/PLATE | 2 - 8d |
| | | CONTINUOUS HEADER TO STUD, TOENAIL | 4 - 8d |

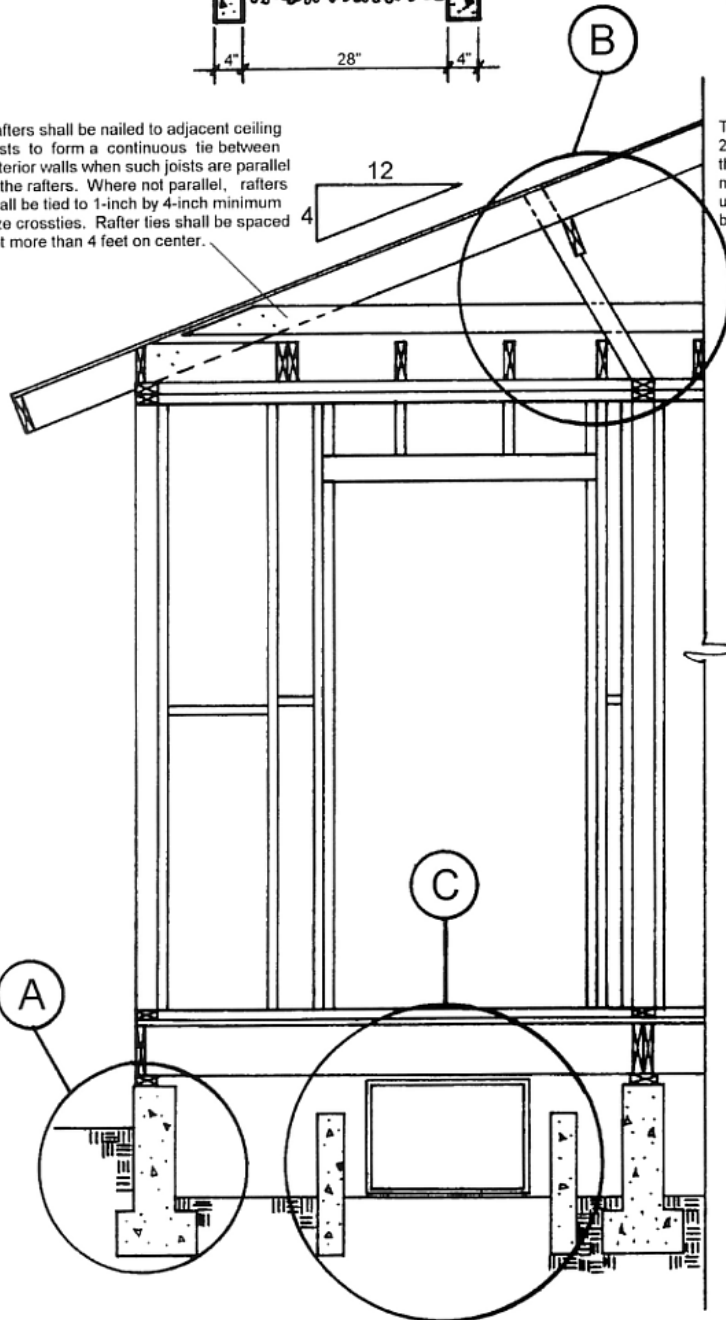


CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL DWELLING DETAILS

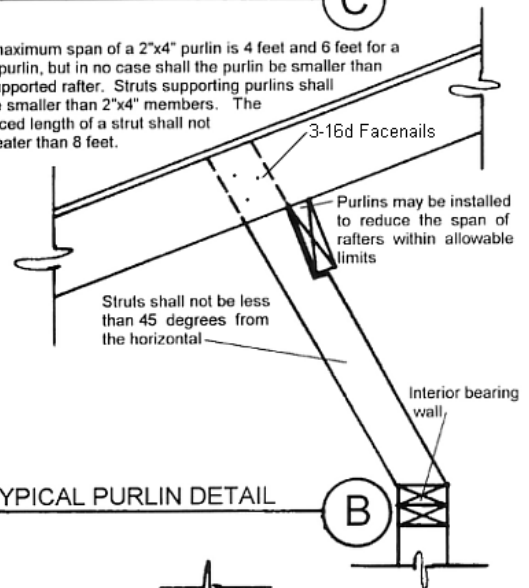


TYPICAL CRAWL DETAIL

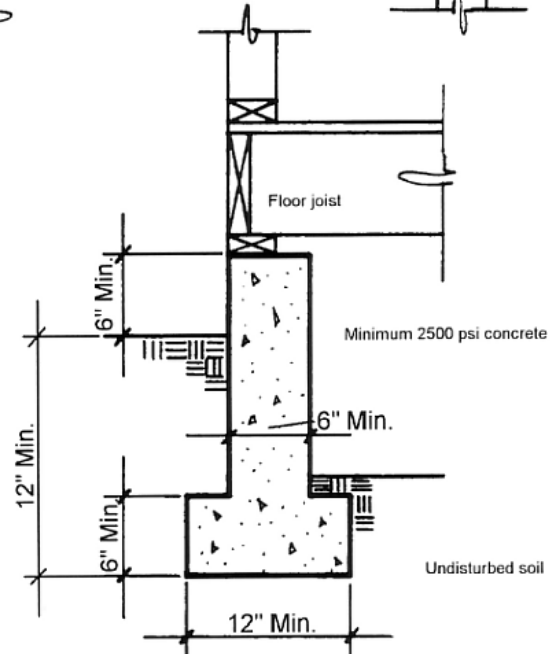
Rafters shall be nailed to adjacent ceiling joists to form a continuous tie between exterior walls when such joists are parallel to the rafters. Where not parallel, rafters shall be tied to 1-inch by 4-inch minimum size crossies. Rafter ties shall be spaced not more than 4 feet on center.



The maximum span of a 2"x4" purlin is 4 feet and 6 feet for a 2"x6" purlin, but in no case shall the purlin be smaller than the supported rafter. Struts supporting purlins shall not be smaller than 2"x4" members. The unbraced length of a strut shall not be greater than 8 feet.



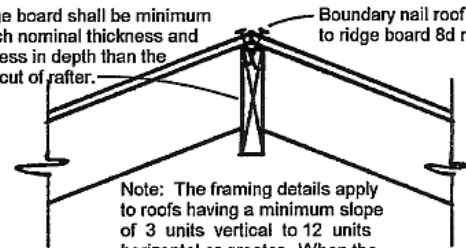
TYPICAL PURLIN DETAIL



EXTERIOR BEARING FOOTING

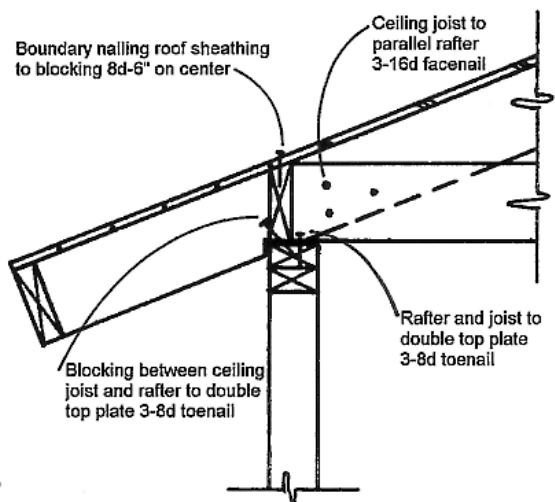
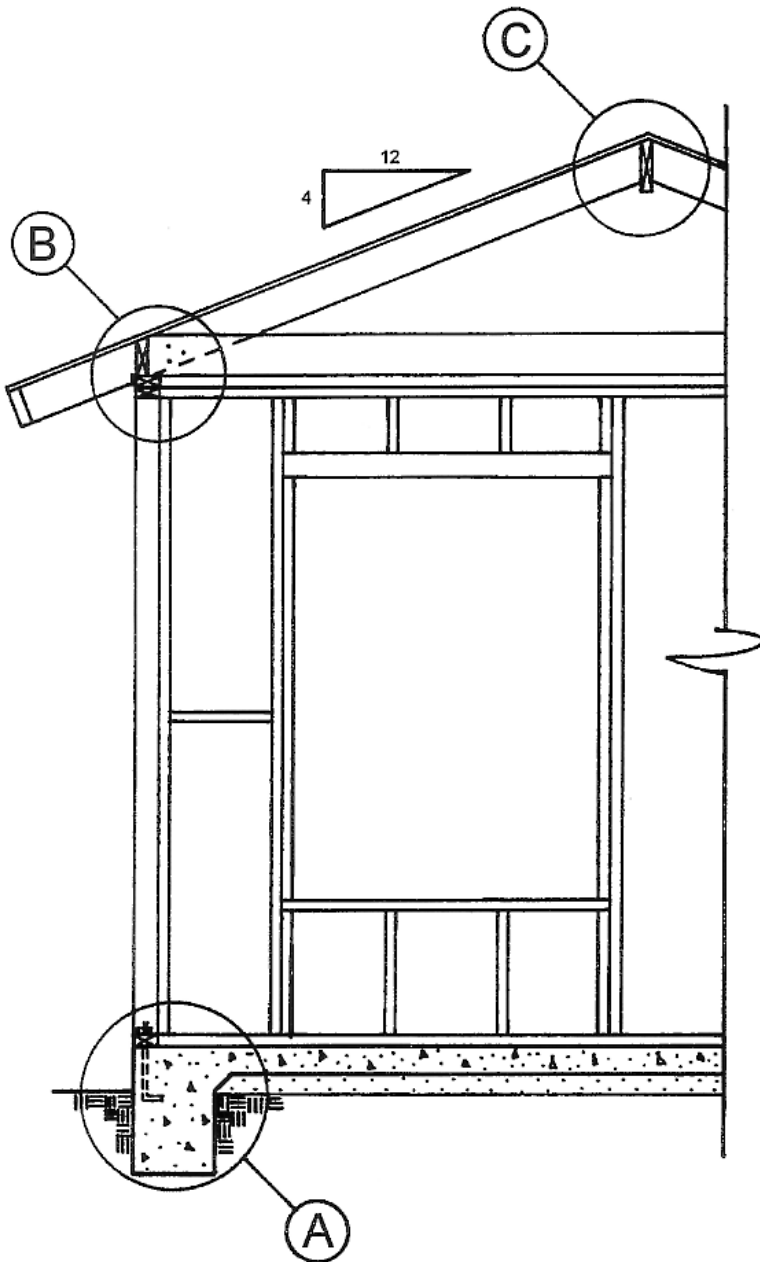
CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL DWELLING DETAILS

Ridge board shall be minimum 1 inch nominal thickness and not less in depth than the end cut of rafter.
Boundary nail roof sheathing to ridge board 8d nails 6" o.c.

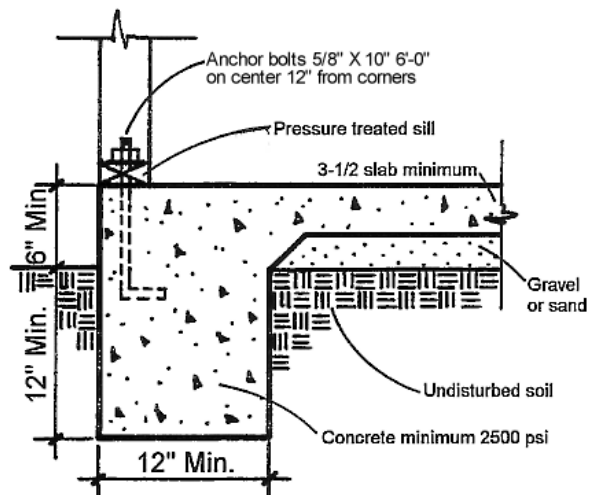


Note: The framing details apply to roofs having a minimum slope of 3 units vertical to 12 units horizontal or greater. When the roof slope is less than 3 - 12 the members supporting rafters and ceiling joists shall be designed as beams.

Typical Ridge Detail (C)



Typical Eave Detail (B)

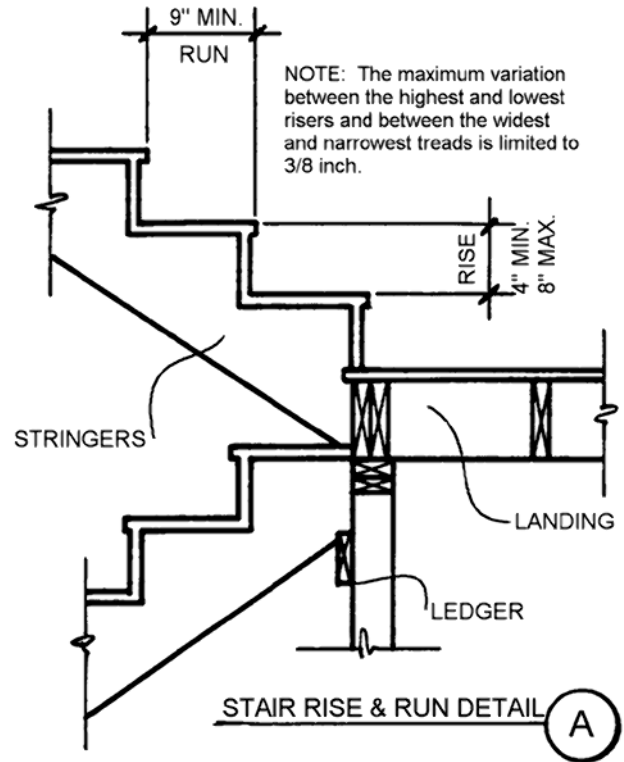


Exterior Bearing Footing (A)

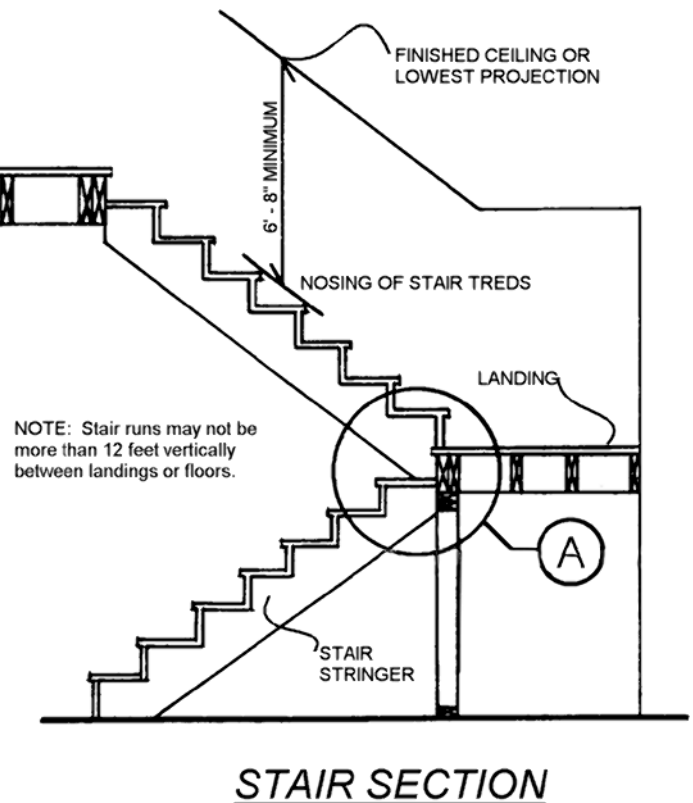
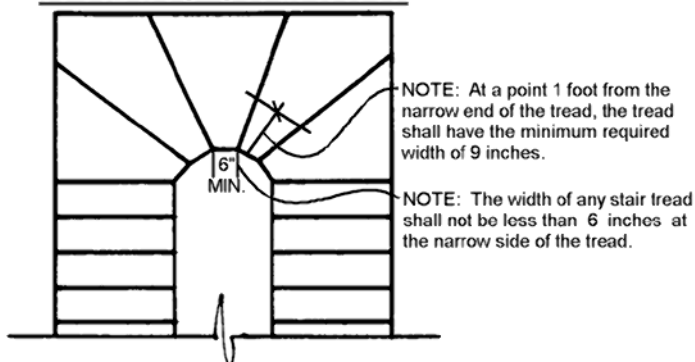
CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL PRIVATE STAIRWAY DETAIL

INSTALLATION CHECKLIST

- ❑ The rise of steps serving dwellings shall not be less than 4 inches or greater than 8 inches. The run of stair treads shall not be less than 9 inches except as permitted in the provisions for winding stairways. Winders may be used if the required width of the run is provided at a point not more than 12 inches from the side of the stairway where the treads are narrower, but in no case shall any width of run be less than 6 inches at any point. (See illustrations)
- ❑ The maximum variation between the highest and lowest risers and between the widest and narrowest treads is limited to 3/8 inch.
- ❑ Stairways serving an occupant load of 49 or less shall not be less than 36 inches in width.
- ❑ Landings shall have a dimension measured in the direction of travel not less than the width of the stairway.
- ❑ The stairway run shall not be more than 12 feet vertically between landings or floors.
- ❑ Every stairway shall have a headroom clearance of not less than 6 feet 8 inches measured from a plane parallel to the stairway tread nosings to the soffit above at all points.



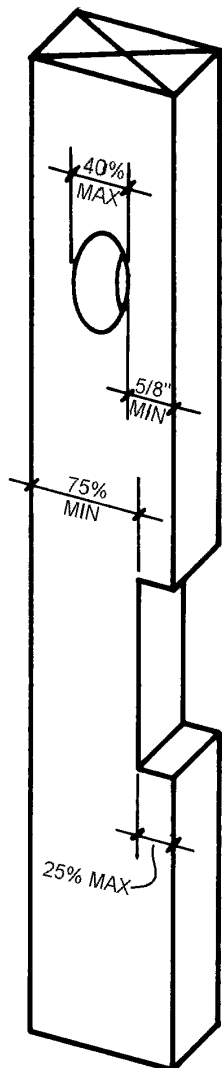
WINDING STAIRWAY



CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
CUTTING, NOTCHING AND BORING OF
WOOD STUDS

EXTERIOR WALLS AND
BEARING PARTITIONS

- ☐ **CUTTING AND NOTCHING**
Maximum depth - 25% of stud width:
 - ☐ 2" x 4" = maximum 7/8" notch.
 - ☐ 2" x 6" = maximum 1-3/8" notch.
- ☐ **BORED HOLES**
Maximum size hole = 40% of stud width:
 - ☐ 2" x 4" = max. 1-7/16" diameter hole.
 - ☐ 2" x 6" = max. 2-3/16" diameter hole.

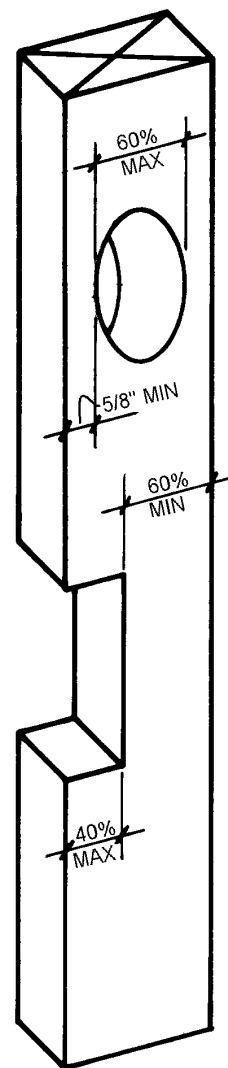


BEARING WALL

NOTE: Bored holes not greater than 60% of the width of the stud are permitted in nonbearing partitions or in any wall where each bored stud is doubled, provided not more than two such successive doubled studs are so bored. In no case shall the edge of the bored hole be nearer than 5/8 inch to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.

NONBEARING PARTITIONS
AND WALLS

- ☐ **CUTTING AND NOTCHING**
Maximum depth - 40% of stud width:
 - ☐ 2" x 4" = maximum 1-7/16" notch.
 - ☐ 2" x 6" = maximum 2-3/16" notch.
- ☐ **BORED HOLES**
Maximum size hole = 60% of stud width:
 - ☐ 2" x 4" = max. 2- 1/8" diameter hole.
 - ☐ 2" x 6" = max. 3-5/16" diameter hole.

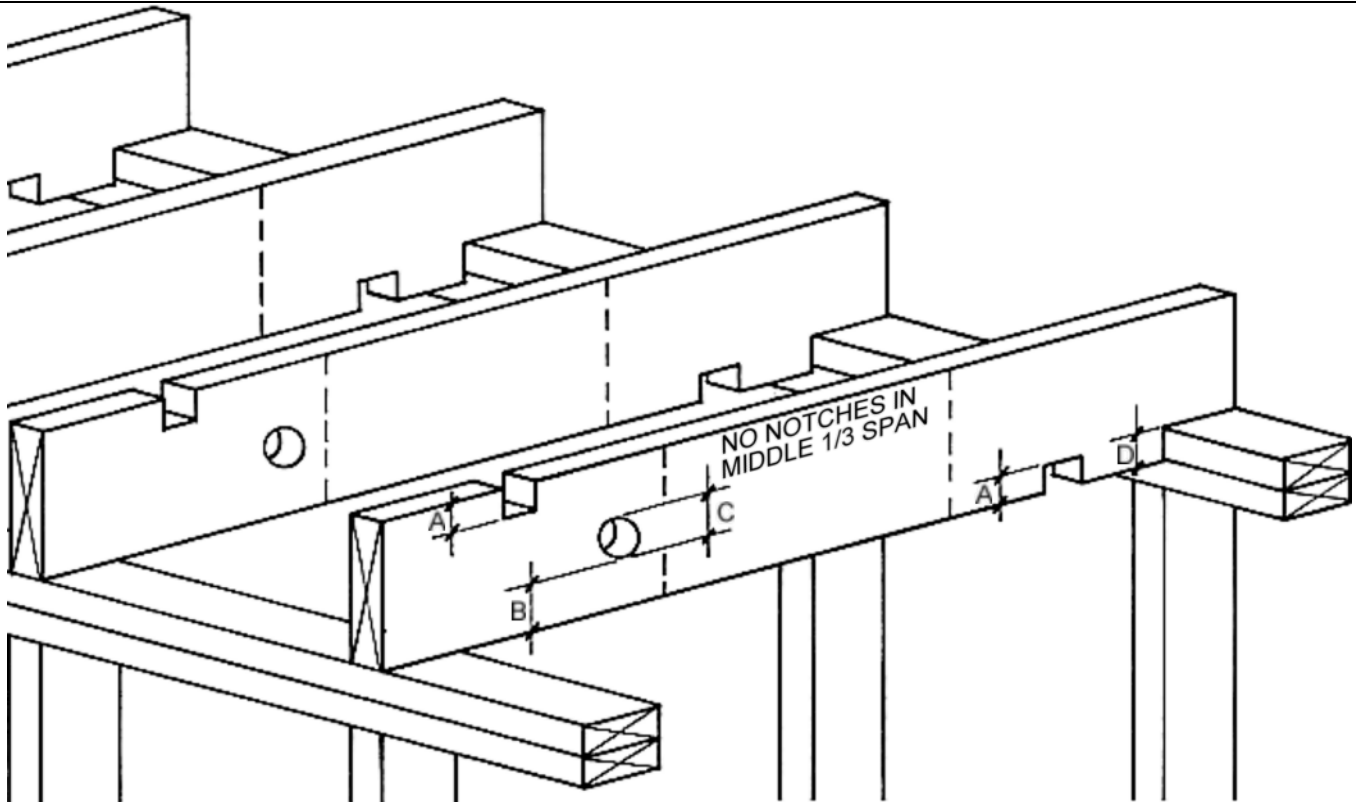


NONBEARING WALL

NOTCHES AND HOLES IN ROOF, CEILING AND FLOOR FRAMING

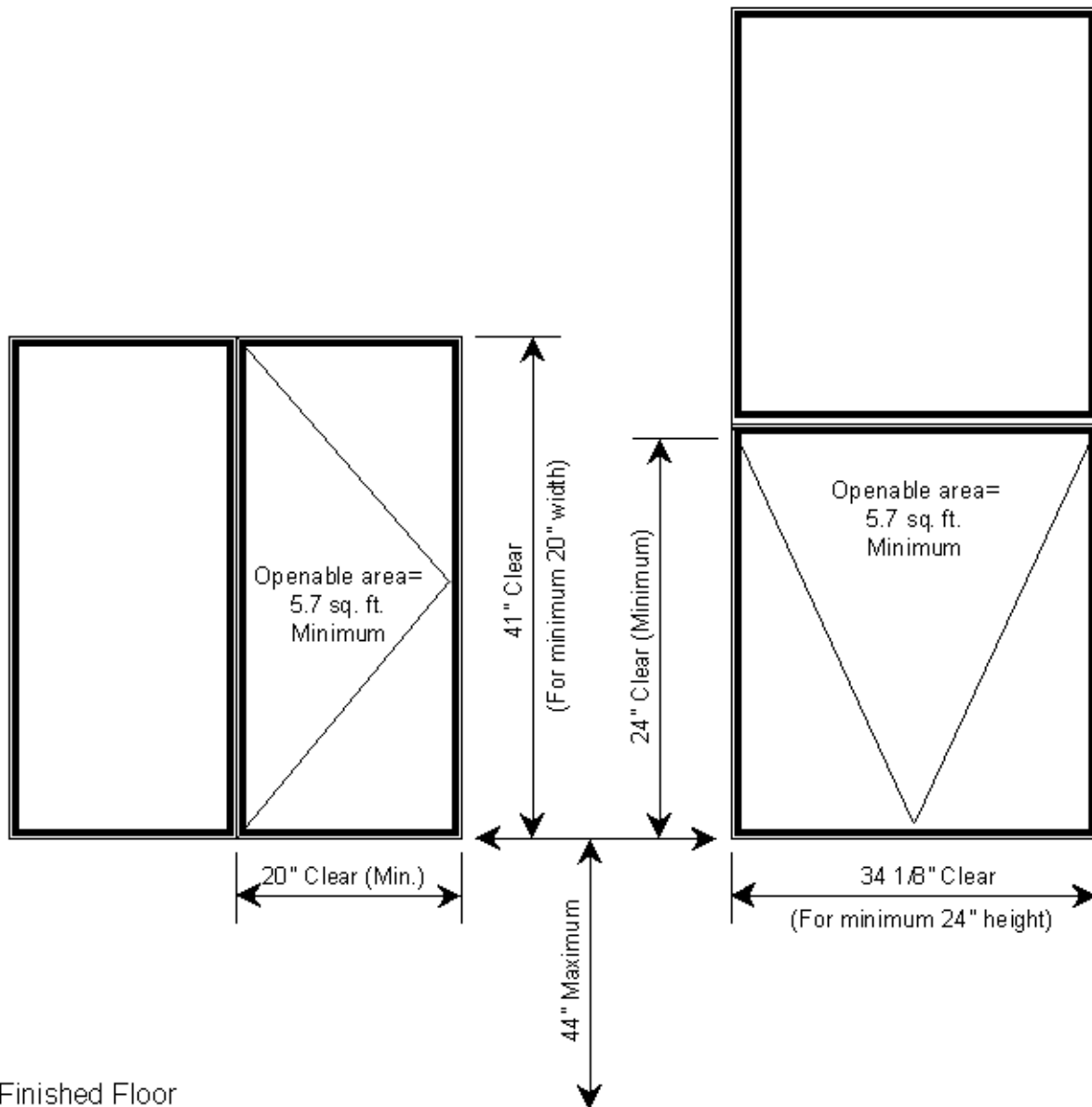
Notching and boring holes in roof, ceiling and floor framing should be avoided whenever possible, especially on the tension side of the member. However, occasionally notches or holes are required to accommodate electrical or plumbing lines. Refer to the following illustration and tables to establish maximum dimensions when notching and boring holes in roof, ceiling and floor framing.

| DETAIL | DEPTH AND DIAMETER OF NOTCHES AND HOLES |
|--------|--|
| A | Notches in the top and bottom of joists and rafters shall not exceed one sixth (1/6) the depth of the member and shall not be located in the middle one third (1/3) of the span. |
| B | Holes bored in joists and rafters shall not be within 2 inches of the top and bottom edge of the member. |
| C | The diameter of holes bored in joists and rafters shall not exceed one third (1/3) the depth of the member. |
| D | Notching at the ends of joists and rafters shall not exceed one fourth (1/4) the depth of the member. |



| Joist & Rafter Size | Max. Notch Depth | Max. End Notch Depth | Max. Hole Diameter | Minimum Bearing | |
|---------------------|------------------|----------------------|--------------------|-----------------|----------|
| | | | | Wood | Concrete |
| 2" x 6" | 7/8" | 1-3/8" | 1-13/16" | 1-1/2" | 3" |
| 2" x 8" | 1-3/16" | 1-13/16" | 2-3/8" | 1-1/2" | 3" |
| 2" x 10" | 1-1/2" | 2-5/16" | 3-1/16" | 1-1/2" | 3" |
| 2' x 12" | 1-7/8" | 2-13/16" | 3-3/4" | 1-1/2" | 3" |

EMERGENCY ESCAPE AND RESCUE WINDOWS



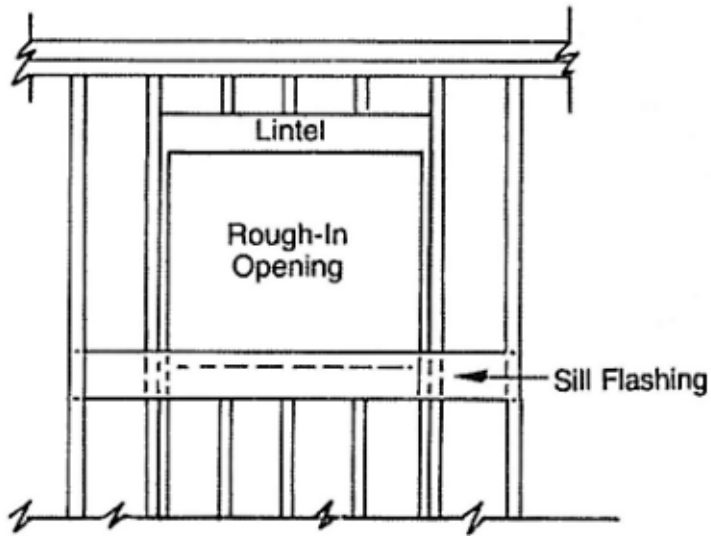
All sleeping rooms in dwelling units below the fourth floor shall have at least one operable window or door approved for emergency escape or rescue. The emergency window or door shall be operable from the inside to provide a full, clear opening without the use of separate tools. Escape or rescue windows shall have a minimum net clear openable area of 5.7 square feet. The minimum net clear height dimension shall be 24 inches. The minimum net clear width dimension shall be 20 inches. When windows are provided as a means of escape or rescue, they shall have a finished sill height not more than 44 inches above the floor.

The table below shows the minimum height and width of required 5.7 square foot openings.

| | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| WIDTH | 27.5 | 28 | 28.5 | 29 | 29.5 | 30 | 30.5 | 31 | 31.5 | 32 | 32.5 | 33 | 33.5 | 34 | 34.5 |
| HEIGHT | 29.8 | 29.3 | 28.8 | 28.3 | 27.8 | 27.4 | 26.9 | 26.5 | 26.1 | 25.7 | 25.3 | 24.9 | 24.5 | 24.1 | 23.8 |

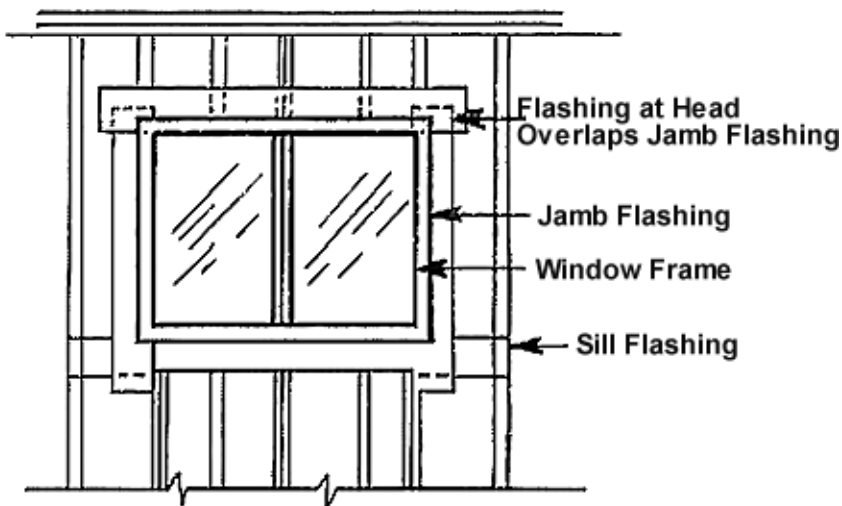
| | | | | | | | | | | | | | | | |
|--------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| WIDTH | 20 | 20.5 | 21 | 21.5 | 22 | 22.5 | 23 | 23.5 | 24 | 24.5 | 25 | 25.5 | 26 | 26.5 | 27 |
| HEIGHT | 41 | 40 | 39.1 | 38.2 | 37.3 | 36.5 | 35.7 | 34.9 | 34.2 | 33.5 | 32.8 | 32.2 | 31.6 | 31 | 30.4 |

TYPICAL EXTERIOR PENETRATION DETAIL



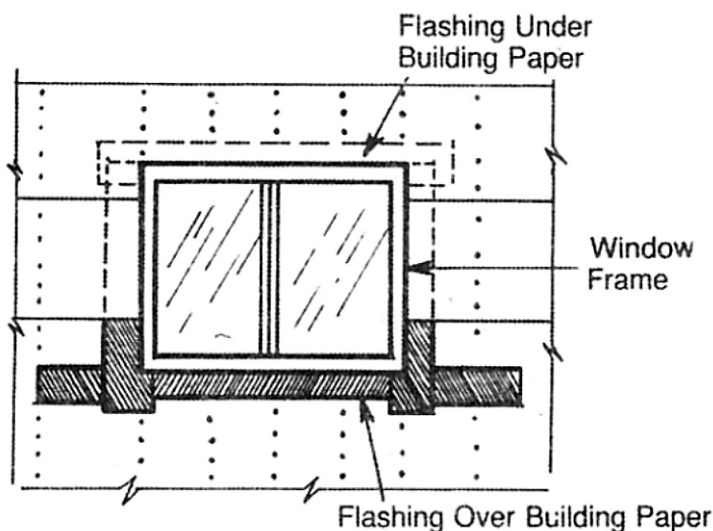
Exterior openings exposed to the weather shall be flashed in such a manner as to make them weatherproof. These illustrations will help you achieve flashing of penetrations to include windows, doors, attic vents, recessed electrical service enclosures and other exterior penetrations.

To flash penetrations, a strip of approved flashing material at least six inches wide must be applied in weatherboard fashion around all openings. Apply the first strip horizontally immediately underneath the sill, cut it sufficiently long to extend past each side of the window, door, or vent, so that it projects beyond the vertical flashing to be applied.



Fasten the top edge of the first segment to the wall, but do not secure the body and lower edge of the first horizontal strip, so the weather resistant building paper applied later may be slipped up and underneath the bottom flashing in weatherboard fashion. In the case of low-set windows, apply approved paper the full height from the bottom of the plate line to the bottom of the window sill when the window is flashed.

Next, apply the two vertical side sections of flashing. Cut the side sections sufficiently long to extend the width of the flashing above the top of the window and the same distance below the window. Apply the side sections over the bottom strip of flashing.



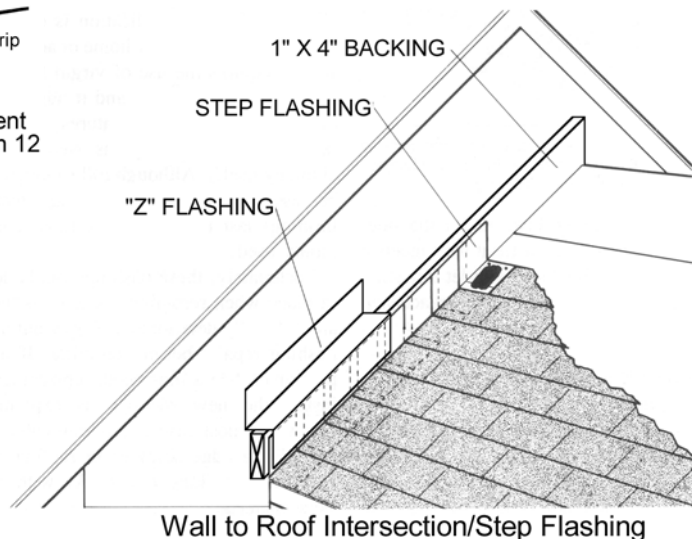
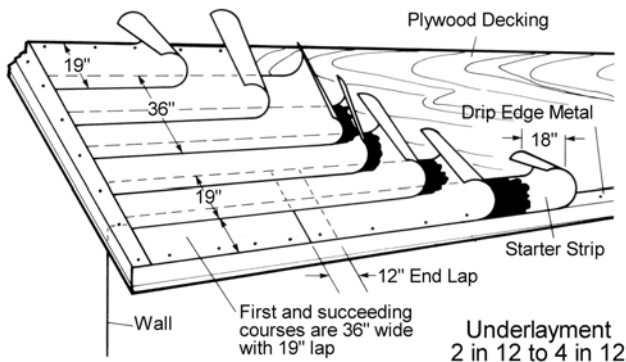
Apply the top horizontal section of flashing last. Cut the top piece of flashing sufficiently long so that it will extend to the outer edge of both vertical strips of side flashing.

The window or penetrating fixture then is installed by pressing the nailing flange positively into a continuous bead of sealant which extends around the perimeter of the inserted fixture.

CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
ASPHALT SHINGLE APPLICATION
ASPHALT SHINGLE ROOF OVER 2 IN 12 PITCH

NEW ROOF OVER SOLID ROOF SHEATHING

- ❑ **Flashing:** All wall to roof intersections shall have 1" x 4" backing installed for "Z" Bar flashing. Step counter flashing shall be installed where the "Z" Bar flashing slopes with the roof. "L" metal counter flashing shall be installed where the roof slopes away from the "Z" Bar flashing. All projections through the roof shall be flashed with roof jacks or other approved flashing.
- ❑ **Roof Sheathing:** Asphalt shingles shall be fastened to solidly sheathed roofs. Plywood roof sheathing is commonly applied over spaced sheathing when the old roofing is stripped off. For roofs with rafters spaced 24 inches on center or less, roof sheathing shall consist of 3/8-inch exterior grade plywood nailed every 6 inches on the edges, and every 12 inches in the field. The roof sheathing shall be applied so the joints are staggered and so the edges land on framing members.
- ❑ **Underlayment for roofs 2 in 12 to 4 in 12 slope:** Asphalt strip shingles may be installed on sloped roofs as low as 2 inches in 12 inches, provided the shingles are approved self sealing and are installed with an underlayment consisting of **two layers** of non-perforated Type 15 felt applied shingle fashion. Starting with an 18-inch wide sheet and a 36-inch wide sheet over it at the eaves, each subsequent sheet shall be lapped 19 inches horizontally. Lap end vertical joints 12 inches minimum. The roof valley flashing shall have a 36 inch wide underlayment directly under it consisting of one layer of Type 15 felt running the running the full length of the valley, in addition to the requirements specified above.
- ❑ **Underlayment for roofs over 4 in 12:** Use one layer of non-perforated Type 15 felt lapped 2 inches horizontally and 4 inches vertically to shed water. The roof valley flashing shall have a 36 inch wide underlayment directly under it consisting of one layer of Type 15 felt running the running the full length of the valley, in addition to the requirements specified above.
- ❑ **Fasteners:** Corrosion resistant nails, minimum 12 gage 3/8 inch head or approved corrosion resistant staples, minimum 16 gage 15/16 crown width. Fasteners shall be long enough to penetrate into the roof sheathing $\frac{3}{4}$ inch or through the thickness of the sheathing whichever is less. Install **four** fasteners for strip asphalt shingles 36 inches to 40 inches in width.
- ❑ **NOTE:** Refer to the manufacturers installation instructions for specific requirements.



CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
ASPHALT SHINGLE RE-ROOF

COMPOSITION SHINGLE OVER EXISTING COMPOSITION SHINGLE

- ❑ **Layers:** Not more than two overlays of asphalt shingle shall be applied over existing asphalt shingle roof.
- ❑ **Flashing:** Rusted or damaged roof jacks and flashing shall be replaced.
- ❑ **Fasteners:** Corrosion resistant nails, minimum 12 gage 3/8 inch head or approved corrosion resistant staples, minimum 16 gage 15/16 crown width. Fasteners shall be long enough to penetrate into the roof sheathing $\frac{3}{4}$ inch or through the thickness of the sheathing whichever is less.

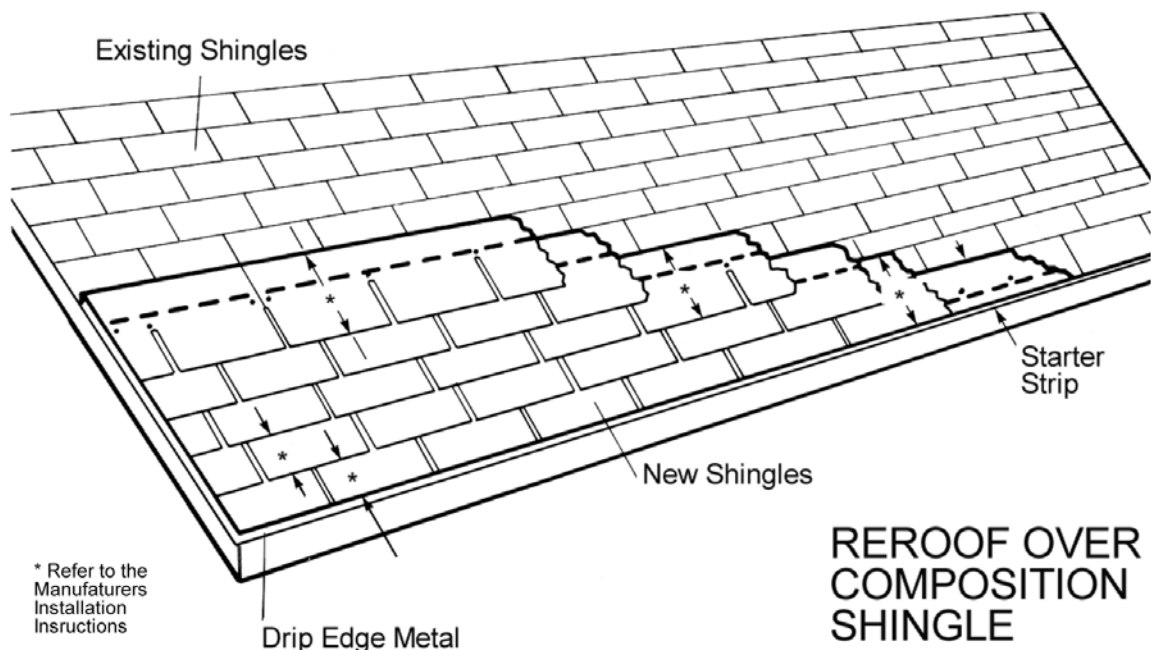
COMPOSITION SHINGLE OVER WOOD SHINGLE

Layers: Not more than two overlays of asphalt shingle roofing shall be applied over wood shingles.

- ❑ **Flashing:** Rusted or damaged roof jacks and flashing shall be replaced.
- ❑ **Underlayment:** Asphalt shingles applied over wood shingles shall have an overlay underlayment of not less than Type 30 non perforated felt lapped 2 inches horizontally and 4 inches vertically to shed water. The roof valley flashing shall have a 36-inch wide underlayment directly under it consisting of one layer of Type 15 felt running the full length of the valley, in addition to the requirements specified above.

COMPOSITION SHINGLE OVER BUILT-UP ROOFING

- ❑ **Layers:** On structures with a slope of 2 in 12 or greater and having no more than one existing built-up roof, one overlay of asphalt shingles may be applied.
- ❑ **Flashing:** Rusted or damaged roof jacks and flashing shall be replaced.
- ❑ **Underlayment 1:** If the built-up roof has a gravel surface, the gravel must first be spudded off to provide a smooth surface. All blisters and irregularities shall be cut and made smooth and secure and an underlayment of not less than Type 30 non-perforated felt shall be installed applied.
- ❑ **Underlayment 2:** If the built-up roof has a smooth or cap sheet surface, all blisters and irregularities shall be cut and made smooth and secure and an underlayment of not less than Type 30 non-perforated felt shall be installed.

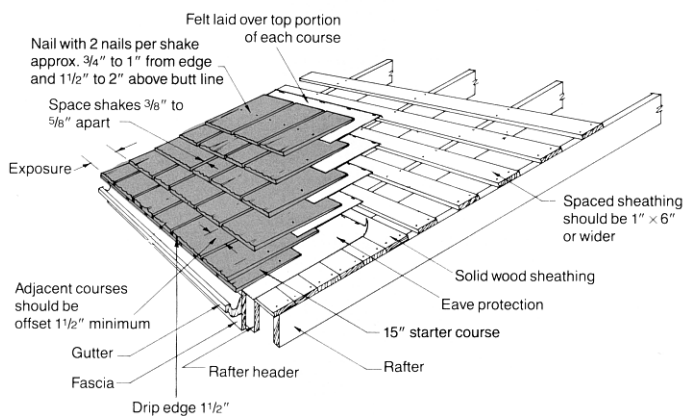


**REROOF OVER
COMPOSITION
SHINGLE**

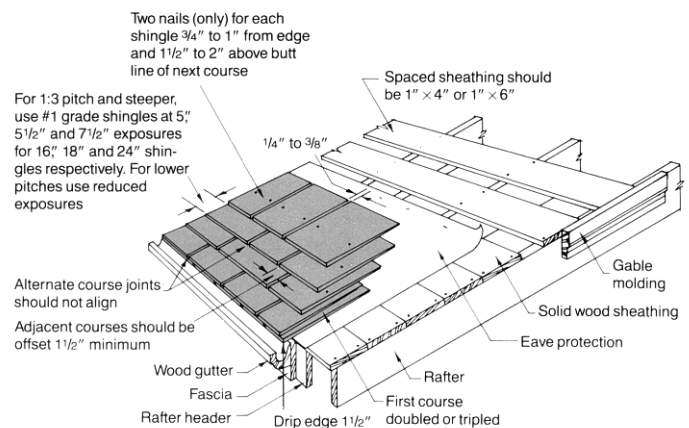
CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
WOOD SHINGLE OR SHAKE APPLICATION

NEW WOOD SHINGLE OR SHAKE ROOF

- ❑ **Flashing:** All wall to roof intersections shall have 1" x 4" backing installed for "Z" Bar flashing. Step counter flashing shall be installed where the "Z" Bar flashing slopes with the roof. "L" metal counter flashing shall be installed where the roof slopes away from the "Z" Bar flashing. All projections through the roof shall be flashed with roof jacks or other approved flashing.
- ❑ **Deck Requirement:** Shingles and shakes shall be applied to roof with solid or spaced sheathing. When spaced sheathing is used, sheathing boards shall not be less than 1 inch by 4-inch nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of the fasteners. When 1 inch by 4 inch spaced sheathing is installed at 10 inches on center, additional 1 inch by 4-inch boards must be installed between the sheathing boards.
- ❑ **Interlayment for wood shingles:** No requirements.
- ❑ **Interlayment for wood shakes:** Install one 18 inch wide interlayment (felt laid between each course) of Type 30 felt shingle between each course in such a manner that no felt is exposed to the weather below the shake butts and in the keyways between the shakes.
- ❑ **Underlayment for shingles and shakes:** No requirements.
- ❑ **Fasteners for wood shingle:** Corrosion resistant nails, minimum No. 14-1/2 gage 7/32-inch head. Fasteners shall be long enough to penetrate into the sheathing $\frac{3}{4}$ inch or through the thickness of the sheathing whichever is less. There must be a minimum 2 fasteners per shingle.
- ❑ **Fasteners for wood shakes:** Corrosion resistant nails, minimum No. 13 gage 7/32-inch head. Fasteners shall be long enough to penetrate into the sheathing $\frac{3}{4}$ inch or through the thickness of the sheathing whichever is less. There must be a minimum 2 fasteners per shake.
- ❑ **Installation of wood shingles:** Shingle shall be laid with a side lap of not less than 1-1/2 inches between joints in adjacent courses. Spacing between shingles shall be approximately $\frac{1}{4}$ ". Each shingle shall be fastened with two nails only, positioned approximately $\frac{3}{4}$ inch from each edge and approximately 1 inch above the exposure line. Starter course at the eaves shall be doubled.
- ❑ **Installation of wood shakes:** Shakes shall be laid with a side lap of not less than 1-1/2 inches between joints in adjacent courses and not in direct alignment in alternate courses. Spacing between shingles shall be approximately $\frac{3}{8}$ inch nor more than $\frac{5}{8}$ inch except for preservative-treated wood shakes which shall have a spacing of not less than $\frac{1}{4}$ inch nor more than $\frac{3}{8}$ inch. Each shingle shall be fastened with two nails only, positioned approximately 1 inch from each edge and approximately 2 inches above the exposure line. Starter course at the eaves shall be doubled.



Shake Application



Shingle Application

CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING
TYPICAL LATH AND EXTERIOR PLASTER DETAIL

WIRE BACKING

Over open wood frame construction, attach wire of not less than No. 18 gage to vertical surfaces, stretched taut horizontally and spaced at not more than 6 inch intervals. Approved self furring paper backed lath may be used in lieu of wire backing.

WEATHER PROTECTION

Over open or solid wood backing frame construction to which metal lath is to be applied, apply water resistant paper to exterior vertical surfaces. Apply paper to supports and lap upper courses over lower courses not less than 2"; lap foundation at least 2"; lap vertical joints at least 6". Double paper should be installed over solid wood backing.

WEEP SCREED

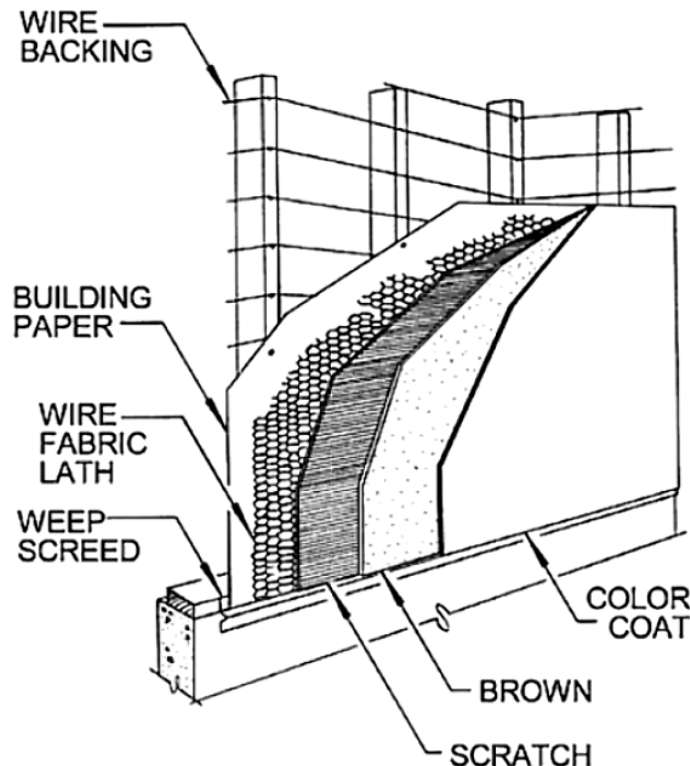
A minimum No. 26 galvanized sheet gage, corrosion-resistant weep screed with a minimum vertical attachment flange of 3 ½ inches shall be provided at or below the foundation plate line on all exterior stud walls. The screed shall be placed a minimum of 4 inches above the earth or 2 inches above paved areas and shall be of a type which will allow trapped water to drain to the exterior of the building. The weather-resistive barrier shall lap the attachment flange, and the exterior lath shall cover and terminate on the attachment flange of the screed.

EXTERIOR LATH

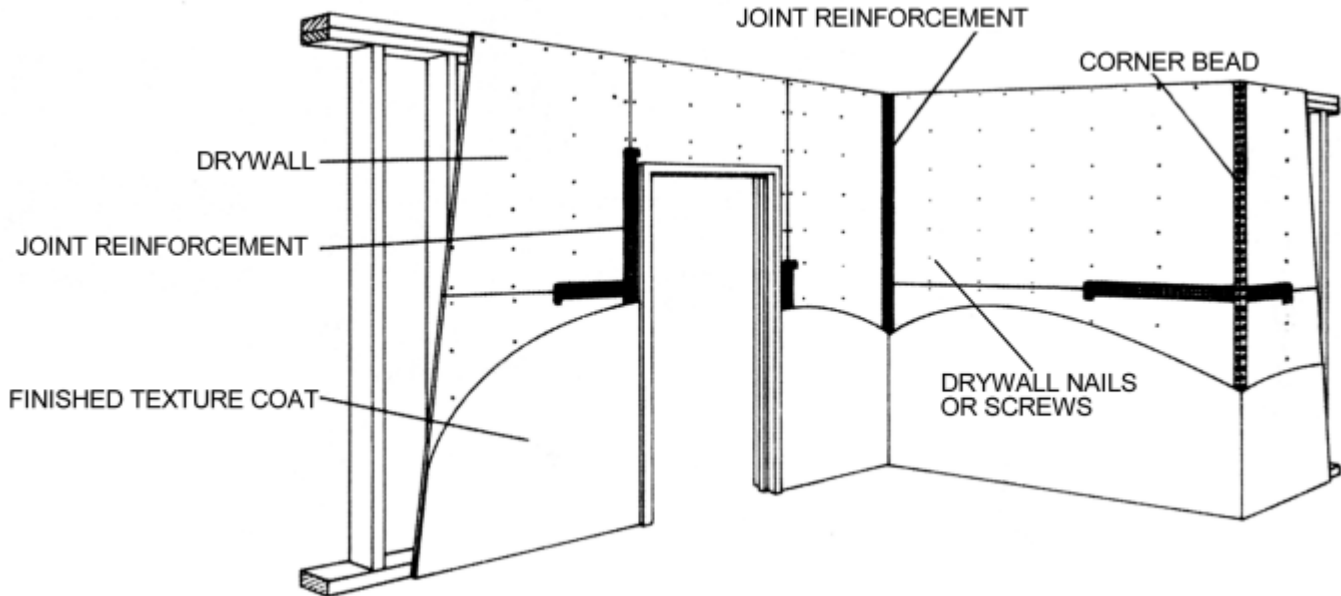
Metal wire lath shall be minimum 16 gage wire and shall be installed with the long dimension of the sheet perpendicular to supports. Metal lath shall be lapped ½" at side and 1" at ends. Stagger ends of lath to avoid continuous joints on the same support. Metal lath shall be attached to vertical supports with 1-1/4" No. 12 gage 3/8" head non corrosive furring nails every 6" maximum on supports. If self furring lath is used, refer to the manufacturers installation instructions for the recommended attachment.

EXTERIOR PLASTER

Plastering with cement plaster shall not be less than three coats when applied over metal lath or wire fabric lath. The *first* coat shall be applied with sufficient material and pressure to fill solidly all openings in the lath. The surface shall be scored horizontally sufficiently rough to provide adequate bond to receive the second coat. The first coat is commonly known as the scratch coat. The first coat shall not be less than 3/8" in thickness. The *second* coat shall be brought out to proper thickness of 3/8", rodded and floated sufficiently rough to provided adequate bond for the finish coat. The second coat shall have no variation greater than ¼ inch in any direction under a 5 foot straight edge. Minimum time interval between brown coat and color coat is 7 days. The *third* or color coat shall be applied with sufficient material and pressure to bond to and to cover the brown coat and shall be of sufficient thickness to conceal the brown coat but not less than 1/8".



CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL DRYWALL INSTALLATION



APPLICATION OF SINGLE LAYER GYPSUM BOARD

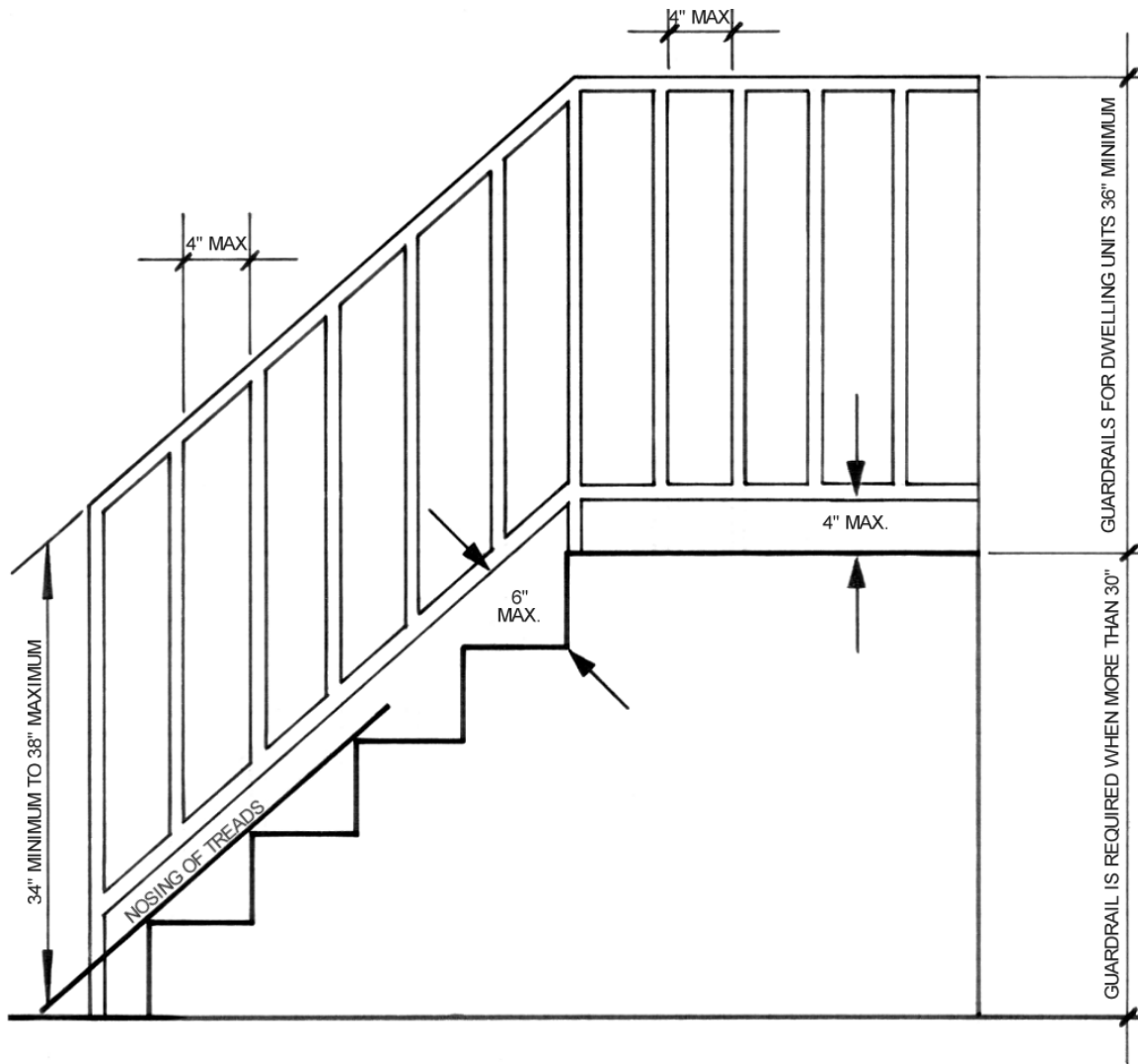
In general apply gypsum board to ceilings first, then to walls. To minimize end joints, use panels of maximum practical lengths. Gypsum board at openings shall be located so that no joint will align with edges of opening unless control joints will be installed at these locations. Stagger end joints in successive courses with joints on opposite sides of a partition placed on different studs. All cut edges and ends of the gypsum board shall be smoothed to make a neat joining.

FASTENERS

The size and spacing of fasteners shall conform to the table below. Space the fasteners when used at edges of boards not more than one inch from the edges and not less than 3/8 inch from the edges and ends of gypsum board. Fasteners should be driven so that the heads are slightly below the plane of the face paper. Avoid fracturing the face paper or damaging the core. Hold the panel in firm contact with the framing while driving the fasteners. Install fasteners in the field on the board, first working towards ends and edges.

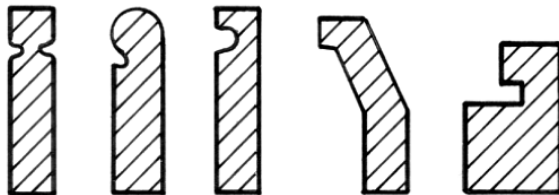
| THICKNESS OF DRYWALL | PLANE OF FRAMING SURFACE | SPACING OF MEMBERS | SPACING OF NAILS | SPACING OF SCREWS | FASTENERS |
|---|--------------------------------|--------------------------|------------------------|-------------------------|---|
| NOTE: Wallboard may be applied parallel or perpendicular to the direction of the framing members except for wallboard applied over studs spaced 24" o.c. which shall be applied perpendicular to framing members only. | | | | | |
| 1/2" | HORIZONTAL | 16" | 7" | 12" | <div>1. Nails: No. 13 gage, 1-3/8" long, 19/64" head</div> <div>2. 0.098" diameter, 1-1/4" long, annular ringed</div> <div>3. 5d cooler 0.086 dia., 1-5/8" long, 15/64" head</div> <div>4. Wallboard 0.086" dia., 1-5/8" long 9/32" head</div> <div>5. Screws shall be long enough to penetrate into wood framing not less than 5/8".</div> |
| | | 24" | | | |
| | VERTICAL | 16" | 8" | 16" | |
| | | 24" | | 12" | |
| 5/8" | HORIZONTAL | 16" | 7" | 12" | |
| | | 24" | | | |
| | VERTICAL | 16" | 8" | 16" | |
| | | 24" | | 12" | |

CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL GUARDRAIL AND HANDRAIL DETAIL

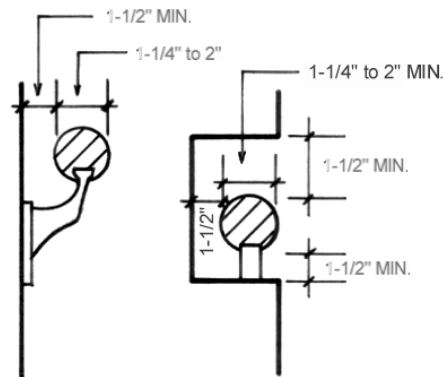


GENERAL REQUIREMENTS: Stairways less than 44" in width or stairways serving individual dwelling units may have a handrail on one side of the stairway. Stairways having less than four risers serving dwellings need not have handrails. The top of handrails and hand extensions shall be placed not less than 34 inches or more than 38 inches above the nosing of treads and landings. Handrails shall be continuous the full length of the stairs. Ends shall be returned or shall terminate in newel posts or safety terminals.

ACCEPTABLE HANDRAIL SHAPES



NOTE: Other shapes of handrails may be acceptable if they provide an equivalent gripping surface as illustrated in the Typical Handrail Detail.

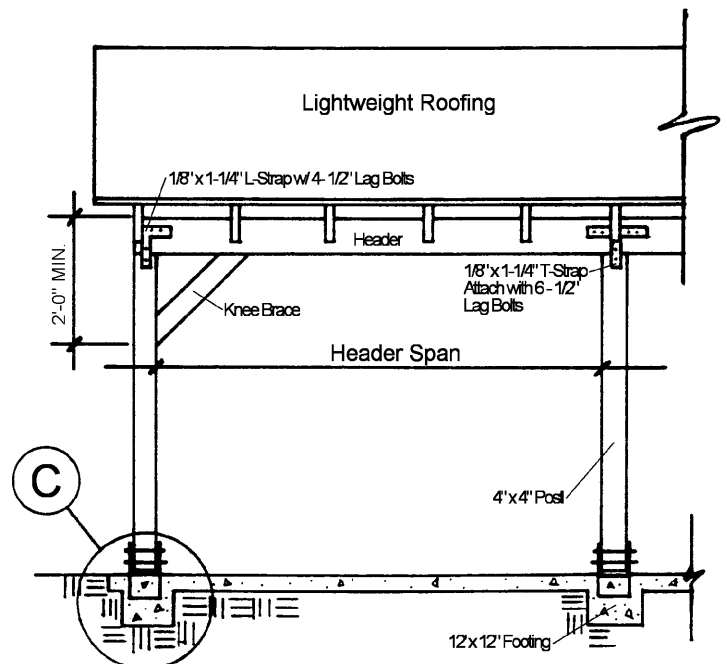
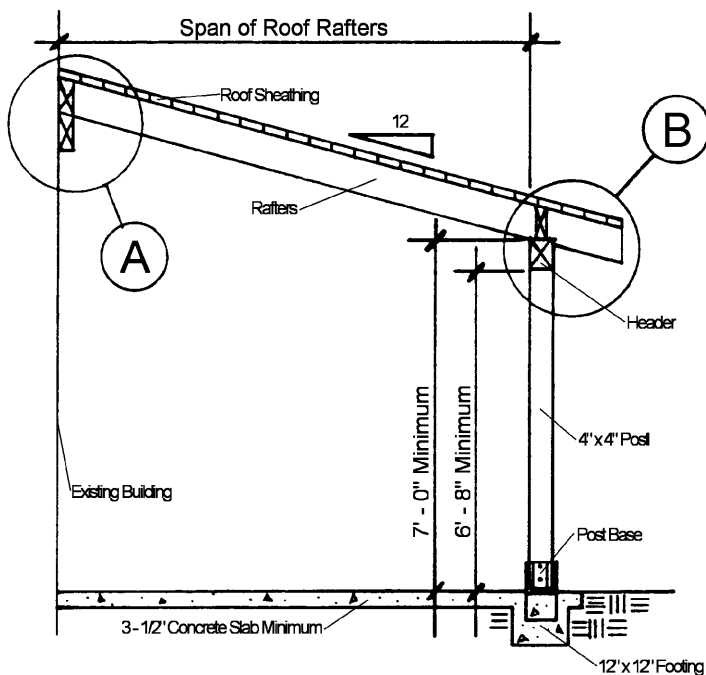


TYPICAL HANDRAIL DETAIL

CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL ATTACHED PATIO COVER

| ALLOWABLE RAFTER SPANS | | | BEAM SPANS | |
|-----------------------------------|---------|-----------------|--|-----------|
| SIZE & GRADE | SPACING | HORIZONTAL SPAN | BEAM SIZE | BEAM SPAN |
| 2" X 4" CONSTRUCTION GRADE | 12" | 10' - 6" | 4" X 4" | 6' - 6" |
| | 16" | 9' - 6" | 4" X 6" | 9' - 6" |
| | 24" | 8' - 6" | 4" X 8" | 12' - 6" |
| 2" X 6" NO. 2 GRADE MINIMUM | 12" | 16' - 9" | 4" X 10" | 15' - 6" |
| | 16" | 14' - 6" | 4" X 12" | 19' - 0" |
| | 24" | 11' - 10" | NOTE: Allowable spans are calculated with use of Douglas Fir-Larch species wood No. 2 grade or better. Notify your inspector if a different wood species is used. | |
| 2" X 8" NO. 2 GRADE MINIMUM | 12" | 21' - 3" | | |
| | 16" | 18' - 5" | | |
| | 24" | 15' - 0" | | |

GENERAL NOTES: Patio covers are one-story structures not to exceed 12 feet in height. Enclosure walls may have any configuration, provided the open area of the *longer wall and one additional wall* is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches of each wall, measured from the floor. Openings may be enclosed with insect screening or plastic that is readily removable translucent or transparent plastic not more than 0.125 inch in thickness. Patio covers shall be used for only recreational, outdoor living purposes and not as carports, garages, storage rooms or habitable rooms. **NOTE: Refer to "Typical Attached Patio Detail" sheet for construction details on page 67.**

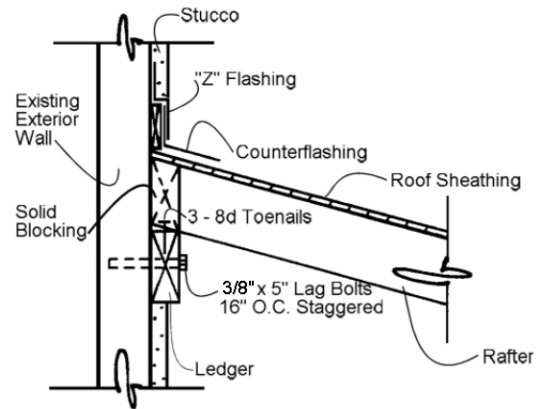


CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL ATTACHED PATIO COVER DETAILS

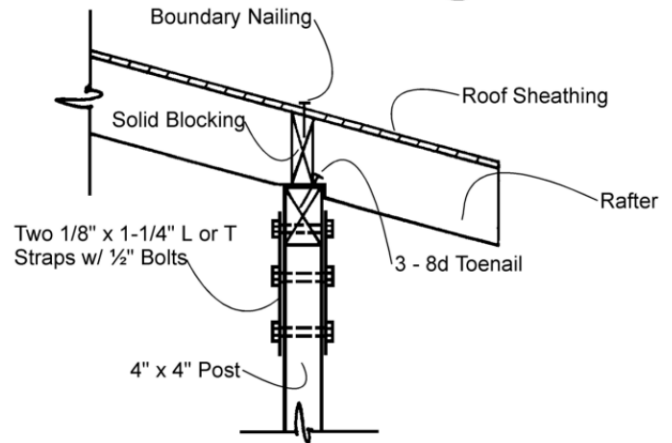
Details A, B, and C may be used when designing and building a patio cover. The Plan Check Engineer at the Building counter must approve other specific designs. ***(Refer to sheet one of the "Typical Patio Cover Detail" for allowable rafter and beam sizes on page 69.)***

Note: A patio cover may be supported on a concrete slab without footings provided the slab is not less than 3-1/2 inches thick and further provided that the columns do not support live and dead loads in excess of 750 pounds per column.

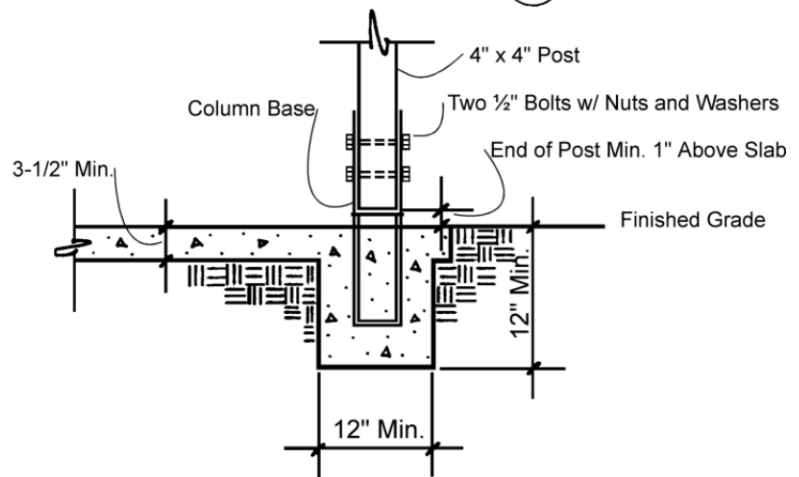
GENERAL NOTES: Patio covers are one-story structures not to exceed 12 feet in height. Enclosure walls may be of any configuration, provided the open area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches of each wall, measured from the floor.



PATIO COVER LEDGER DETAIL (A)



PATIO COVER EAVE DETAIL (B)



PATIO COVER FOOTING DETAIL (C)

CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
MINIMUM REQUIREMENTS FOR
6" OR 8" BLOCK WALL

| WALL HEIGHT | "T" TYPE FOUNDATION | | | REBAR LAP | "I" TYPE FOUNDATION | | VERTICAL REBAR | HORIZONTAL REBAR |
|-------------|---------------------|-----|----|--------------------------|---------------------|-----|---|--|
| | W | D | T | L | W | D | | |
| 3' - 6" | 14" | 12" | 6" | 15" | 12" | 22" | #3 REBAR @ 48" O.C. | #3 @ Top & bottom of the wall and bottom of the foundation. |
| 4' - 6" | 18" | 12" | 6" | 15" | 12" | 26" | #3 REBAR @ 32" O.C. | " |
| 5' - 6" | 22" | 12" | 6" | 15" | 12" | 30" | #3 REBAR @ 24" O.C. | " |
| 6' - 6" | 24" | 14" | 8" | 15" | 12" | 32" | #3 REBAR @ 16" O.C. | # 4 @ Top & bottom of the wall and bottom of the foundation. |
| 8' - 0" | 30" | 16" | 9" | 15" for #3 20" for #4 | 12" | 40" | 6" BLOCK #3 REBAR @ 8" O.C. 8" BLOCK #4 REBAR @ 24" O.C. | # 4 @ Top & bottom of the wall and bottom of the foundation. |

GENERAL REQUIREMENTS:

Horizontal bond beam reinforcement is required to be located in the bottom course and the second from the last course of the wall. Prefabricated joint reinforcement in each two top mortar joints may be substituted for the horizontal bond beam reinforcement in the top of walls 6 feet or less in height. Prefabricated joint reinforcement in masonry walls shall be two No. 9 gage galvanized wires with No. 9 gage steel welded cross wires spaced maximum 16 inches on center. The wires shall be thoroughly embedded in the bed joint mortar. Lap all wires 12 inches minimum. Horizontal steel is also required at the bottom of the footing. Maintain 3-inch minimum clearance for all horizontal and vertical reinforcement from the bottom and sides of the trench. Hollow unit masonry walls may be partially grouted with grout confined to those cells which have horizontal and vertical reinforcing steel except for 8'-0" high walls which shall be grouted solid.

SPECIFICATIONS:

Concrete: Minimum 2000 P.S.I. in 28 days.

Block: Grade "N" A.S.T.M. C 90-86.

Reinforcement: A.S.T.M. A 615 Grade 40 or higher.

Mortar: 1-½ : 4-½ mix (cement, lime, sand by volume).

ZONING NOTES:

1. Fence height shall be measured from finished grade adjoining the fence on the public right-of-way side of the fence and/or from the average grade of both sides of the fence between two private properties. For lots that slope more than 5 feet front to rear, contact staff at the Zoning counter to establish fence height.

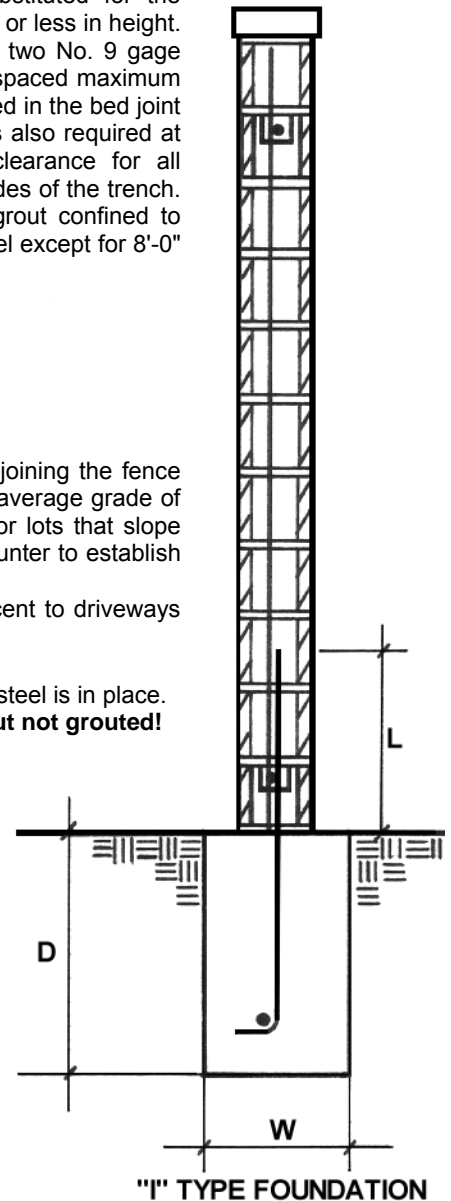
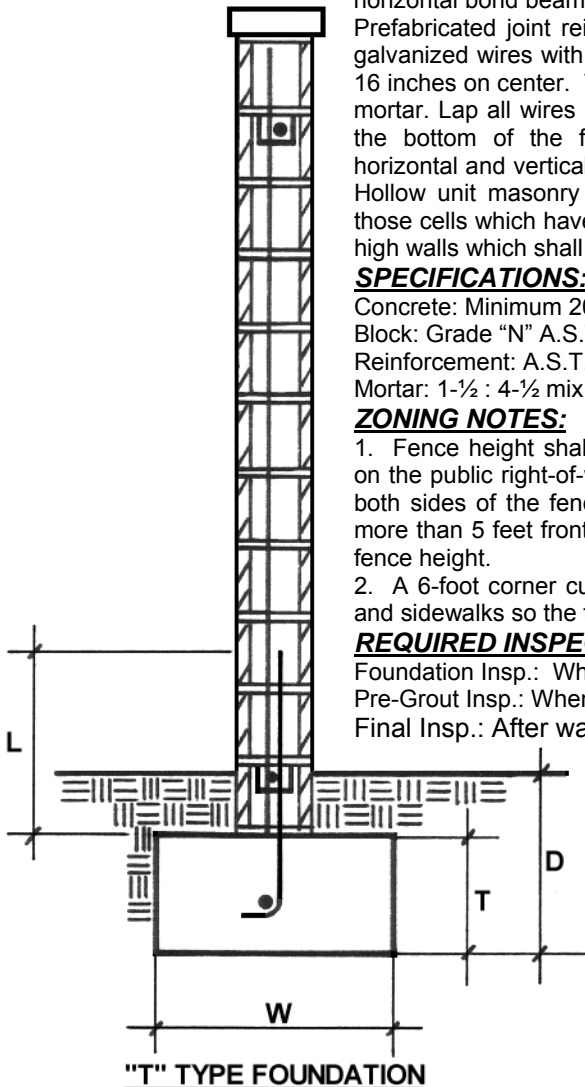
2. A 6-foot corner cutoff may be required for fencing adjacent to driveways and sidewalks so the fence does not obstruct visibility.

REQUIRED INSPECTIONS:

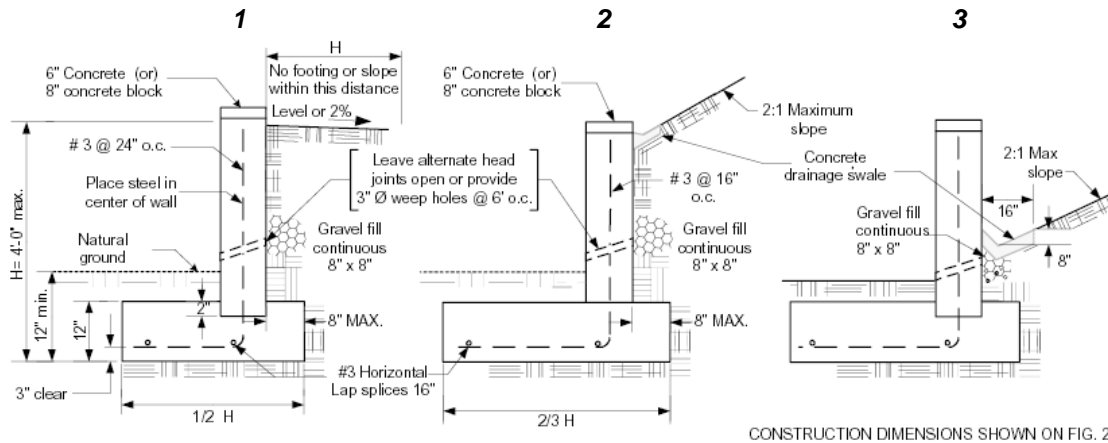
Foundation Insp.: When trench is ready for concrete and all steel is in place.

Pre-Grout Insp.: When wall is built and all steel is in place, **but not grouted!**

Final Insp.: After wall is grouted and cap is installed.



CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
RETAINING WALL OR SLOUGH WALL DETAIL



(NO PERMIT IS REQUIRED FOR FIG. 1)

(PERMIT IS REQUIRED FOR FIG. 2 AND FIG. 3)

NOTES

These walls are designed for the average condition and may not be suitable in all cases. Where the proposed wall construction is extensive, a licensed civil or structural engineer should be consulted.

GENERAL SPECIFICATIONS

1. All footings to be 12" into natural ground.
2. Concrete mix for footing and for concrete wall to be 1 part Portland cement, 2 parts sand, and 3 parts 1" rock with a maximum of 7 gallons of water per sack of cement.
3. Grout mix for concrete block wall to be 1 part Portland cement, to 3 parts sand to which may be added not more than 1/10 part lime. Sufficient water to be added to produce consistency for pouring without segregation of the constituents. Grout may contain pea gravel to a maximum size of 3/8".
4. Mortar mix for concrete blocks to be 1 part cement to 1/4 lime putty or hydrated lime to 3½ parts damp loose sand.
5. Concrete block units to be standard 8"x8"x16" units conforming to UBC Standard 21-4.
6. Reinforcing steel shall be deformed steel conforming to A.S.T.M. Specification A-615. Lap all steel 16".
7. Concrete block units to be staggered (running bond).
8. Concrete block units to have vertical continuity of the cells unobstructed. All cells containing reinforcing to be filled solid with grout.
9. The designs illustrated on this information bulletin do not apply to locations with expansive soil.

CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING
SWIMMING POOL, SPA AND HOT TUB
FENCING REGULATIONS

STATE LAW

The “Swimming Pool Safety Act” embodied in the California Health and Safety Code, Chapter 5, Division 104, Part 10, Article 2.5 sets forth requirements for protecting youngsters from accidental drowning in private pools, spas and hot tubs over 18 inches deep.

FENCING REQUIREMENTS

Protection shall be provided by enclosing the pool, spa, or hot tub with a fence meeting the following requirements:

1. The minimum height shall be 60 inches measured on the outside of the fence.
2. The maximum clearance from the bottom of the fence to the ground shall be 2 inches.
3. There shall be no gaps or voids in the fence which would allow passage of a sphere of 4 inches or greater.
4. There shall be no protrusions, cavities or handholds that would allow a 5-year-old child to climb over the fencing.

GATES

All gates through the fencing shall open away from the pool, spa or hot tub, be self closing, and have self latching devices placed at least 60 inches above the adjacent grade.

DOORS DIRECTLY INTO POOL AREA

Any door that is **NOT** separated from a pool, spa or hot tub by a complying fence enclosure shall be equipped with exit alarms **OR** be self-closing and latching with the release mechanism at least 54-inches above the interior floor. Where an exit alarm is used, it may be placed solely on the companion screen door provided the screening is substantially protected to preclude damage and tearing.

WINDOWS FROM RESIDENCE DIRECTLY INTO POOL AREA

Any first floor window that is NOT separated from a pool, spa, or hot tub by a complying fence enclosure which has a sill height less than 48 inches above the interior floor shall be equipped with exit alarms OR be self-closing and latching. Where an exit alarm is used, it may be placed solely on the companion window screening provided the screening is in good repair.

EXIT ALARMS

Exit alarms may be either battery operated or connected to the electrical wiring of the building , and shall meet the following specifications:

1. The alarm shall sound continuously of a minimum of 30 seconds immediately after the door is opened;
2. Be capable of producing a sound pressure of not less than 85 decibels when measured indoors at 10 feet;
3. Shall automatically reset;

4. Be equipped with a manual means, such as a touch pad or switch located not less than 54 inches above threshold of the door, to temporarily deactivate the alarm for no longer hat 15 seconds.
5. Where battery operated, be capable of providing an audible warning signal when the battery charge falls below 33% capacity.

POOL COVERS

Instead of the above requirements, a pool can be equipped with an “approved safety pool cover” meeting all of the performance standards of the American Society for Testing and Materials (ASTM) in compliance with Standard F1346-91. A hot tub or spa equipped with a locking safety cover complying with ASTM-ES 13-89 is exempt from all the regulations.

ELECTRICAL

GENERAL

Permits are required before starting work. Permits are available to owners of single-family dwellings and two family dwellings provided the owner installs the work, or a member of the immediate family, and the owner resides or intends to reside in such dwelling.

Permits become null and void if work authorized is not commenced within 180 days of the issuance or if such work is suspended or abandoned at any time after the work is commenced for a period of 180 days.

All work shall comply with the National Electrical Code and the Electrical Regulations of the Long Beach Municipal Code.

No work shall be covered or energized without first having been inspected and approved.

It is recommended that spare electrical capacity be installed initially to allow for the addition of future electrical appliances at minimum costs.

WHO CAN OBTAIN PERMITS?

Permits shall be issued to duly licensed contractors. However, a homeowner can obtain a permit to do the construction, alteration or repair of a one or two-family dwelling and accessory buildings or facilities thereto if:

1. The owner resides or intends to reside in the dwelling, showing proof of residence;
2. The electrical work is performed by the owner, and
3. The owner signs a statement that no person will be employed in a manner as to become subject to the workers' compensation laws of the State of California. When a permit is taken out, the signature and identity of the applicant must be verified. A California Driver's License, State of California Identification Card, or other positive identification will meet this requirement. Contractors working in the City of Long Beach are required to have a Long Beach business license. If a contractor has employees, proof of Workers' Compensation Insurance must be shown at the time of permit issuance. Contractors working alone may waive this requirement, but must show a pocket copy of their State Contractor's License.

WHEN IS A PERMIT NEEDED?

No new electrical installation shall be made nor any alteration or addition performed to any existing wiring, nor shall any wiring for the placing or installation of any electric light, power or heating device, or any apparatus which generates, transmits, transforms or utilizes electricity operating at a voltage exceeding twenty-five volts between conductors or capable of supplying more than 50 watts, be made without first obtaining an electrical permit.

Exception:

A separate electrical permit shall not be required for any electrical work involving a Group R, Division 3 or Group M Occupancy for which a combined permit has been obtained.

A. No permit shall be required in the following cases:

1. Electric wiring expressly declared to be exempt from the provisions of this chapter by any other section hereof;
2. Repair or replacement of any fixed motor of the same rating on the same machine or the repair or replacement of any fixed electrical appliance of the same rating in the same location;
3. Repair or replacement of current carrying parts or any switch or control device;
4. Reinstallation of attachment wall plug receptacles or wall switches but not the outlet therefor;
5. Repair or replacement of any overcurrent device or lamp holder of the same rating and in the same location;
6. Repair or replacement of electrodes or transformers for signs or marquees;
7. Repair or replacement of cords or cables or cord pendants allowed by other sections of this chapter;
8. Taping of joints;
9. Removal of electric wiring;
10. Any similar minor repair or replacement determined by the Building Official to involve any hazard to life or property;
11. The installation by Southern California Edison Company of radio-controlled relays on privately-owned air conditioning equipment in the company's program of energy conservation through electrical load management, entitled "Air Conditioner Cycling Program," provided that:
 - ☐ The relays shall be tested and labeled by Underwriters' Laboratories, Inc.,
 - ☐ The Building Official shall approve of specifications for the installation of the relays, and
 - ☐ The relays shall be installed and maintained by Southern California Edison Company or its contractors.

B. The foregoing exemptions from permit requirements shall not be deemed to permit or allow any electric wiring to be done in a manner contrary to other provisions of this chapter, nor to permit such work to be done by unauthorized or unlicensed person or persons.

INSTALLATION

All electrical materials and equipment shall be new and approved for the intended use and location by a recognized testing laboratory such as Underwriters' Laboratories, Electrical Testing Laboratories, or Factory Mutual. Used construction materials shall not be installed without special permission obtained in advance.

Conduits, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place. Conduits and cable assemblies shall be continuous from outlet to outlet and from fitting to fitting.

Where cables run through holes in studs, joists or similar wood members, holes shall be bored at the approximate center. Where there is no structural objection, armored cable or non-metallic sheathed cable shall be protected against the penetration of driven nails by covering the notch with a steel plate at least 1/16 inch thick before building finish is applied.

There shall be no splices within the conduits. An approved box shall be installed at each outlet, switch, or junction of conduit, electrical metallic tubing, armored cable, or non-metallic sheathed cable. At least 6 inches of wire, measured from the face of the box shall be left at each outlet and

switch point for making up joints for the connection of fixtures or devices. Splices shall be made electrically and mechanically secure and be covered with an approved insulated solderless connector.

Wires shall be of adequate size for supplying their connected load. Wires shall be considered as properly protected when the fuse or circuit breaker is set at a rating that does not exceed the allowable current carrying capacity of the wire. **(See “Conductor Size and Conduit Requirements” on page 84.)**

Interior wiring systems shall be polarized and all wire shall be an approved type having an insulating, flame-retardant covering. Wires used as neutral conductors of circuits shall have white insulation. Green insulation shall be used for grounding conductors only. Wires shall not be smaller than No. 14AWG. Wires used in wet location shall be TW, RW or other approved type.

Metal raceways, cable armor, and fittings shall be grounded. Metallic outlet boxes, lighting fixtures, and appliances with exposed non-current-carrying metal parts shall be grounded. These shall be mechanically joined together into a continuous electrical conductor so as to provide effective electrical continuity to ground.

INSPECTIONS REQUIRED

Inspection and approval of wiring prior to energizing:

1. All electric wiring, as defined in this chapter, for which a permit is required, must be inspected and approved before being energized or used.
2. No person shall use, operate or maintain, or cause or permit to be used, operated or maintained, any such electric wiring until such inspection and approval.
3. No serving agency shall furnish or supply or cause or permit to be furnished or supplied, electric energy to any such electric wiring until such inspection and approval.
4. Nothing contained in this section shall be construed to prohibit the temporary use of electric energy when and as specifically provided in this chapter.
5. Nothing contained in this section shall be construed to prohibit the inspection of any electric wiring even though no permit is required therefor. If approval is withheld, a written notification showing the date, location of defect in the work, with the signature of the inspector, shall be sent to the permittee or posted on the premises. Failure of the permittee to make such corrections within ten days after notification thereof is sufficient cause for refusal to issue any further permits to the permittee until such corrections have been made.

INSPECTION OF NEW WORK

1. No person shall conceal, enclose or cover, or cause or permit to be concealed, enclosed or covered, any portion of any electric wiring in any manner that will interfere with or prevent the inspection and approval thereof.
2. Any portion of any floor, ceiling, wall, partition, roof, finish or other obstruction whatsoever which renders impracticable the making of a complete and thorough inspection of electric wiring shall be removed upon notice (either verbal or in writing) to do so, and shall be kept removed until such electric wiring has been inspected and approved.
3. The provisions of this section shall not apply to finished work, or to conductors inserted in conduit or other wiring enclosures.

4. Before a final inspection of any electric wiring, all plaster, concrete or other foreign material shall be thoroughly removed from every box and wiring enclosure, and not less than six inches of jointless conductors shall extend out of each lighting outlet box for future connection thereto, except when conductors are intended to loop through the box.
5. In any case where one or more taped joints are found not soldered at the time of inspection, the inspector may require every joint for such electric wiring to be left untaped until the inspection and approval thereof.
6. Fixtures or appliances shall not be connected to electric wiring until the rough wiring has been inspected and approved except as otherwise satisfactory to the Building Official.
7. All such wiring shall be free from grounds, shorts, or other defects, before approval thereof.
8. Whenever any electric wiring has been inspected and found to comply with the provisions of this chapter, the inspector shall leave a notice at the service switch or other suitable place so stating, and the Building Official shall issue a certificate of inspection when requested, or service permit authorizing the connection to the electrical service and the energizing of the installation.

WIRING METHOD

Non-metallic sheathed cable may be used where it is totally concealed within wood frame walls or attic spaces. Non-metallic cable shall not be used in cabinets, wet or damp locations, nor as portable cables. In attics, mechanical protection of cables is required within 6 feet of scuttles and mechanical equipment. Non-metallic sheathed cable shall be secured at intervals not to exceed 4 feet 6 inches and within 12 inches of every outlet box or fitting. A change from non-metallic sheathed cable to a metal-protected wiring system shall be made in an accessible metallic junction box. Non-metallic sheathed cable shall be of the type having grounding wire in addition to the energized wires.

Armored cable may be used if properly protected from mechanical injury. Armored cable may be used for both exposed and concealed work in dry locations. At all points where the armor terminates, an approved insulating bushing shall be secured and protected in a manner similar to non-metallic sheathed cable. A change from armored cable to another wiring system shall be made in an accessible metallic junction box.

Flexible metal conduit, not less than 1/2-inch electrical trade size, may be used if properly protected from mechanical injury. Flexible metal conduit shall be secured by an approved means at intervals not exceeding 4 feet 6 inches and within 12 inches of every outlet box or fitting. All ends shall be reamed or burred to remove rough edges. Bends of flexible metal conduit shall be made so that the conduit will not be injured. A run of flexible metal conduit shall not contain more than four quarter bends between outlets or fittings. A grounding conductor (green) shall be provided whenever the length of run exceeds six feet.

Outlet, switch and junction boxes, fittings and cabinets shall be securely fastened in place. Non-metallic boxes may be used only with a non-metallic wiring system. Metallic boxes used with non-metallic wiring systems shall be grounded.

Boxes and fittings installed in damp or wet locations shall be weatherproof. Outlet boxes for concealed work shall have a depth of at least 1-1/2 inches. Conduits or cables entering boxes shall be secured with approved clamps or connectors. Where non-metallic outlet boxes are used with non-metallic sheathed cable, the clamping of individual cables to the box is not required if the cable is secured within 8 inches of the box.

Each outlet of the junction box shall be provided with a cover. Metal plugs shall effectively close unused openings in boxes and cabinets. In walls or ceilings constructed of wood or other combustible material, outlet boxes and fittings shall be flush with the finished surface. In walls of non-combustible materials, boxes and fittings shall be installed so that the front edge of the box or fitting will not set back more than 1/4 inch. Junction boxes shall be installed in an accessible location.

BRANCH CIRCUITS

Each single-family dwelling should be provided with one or more lighting branch circuits of 15 or 20 amperes in rating.

In every livable room including kitchen, family, dining, and bedroom, a general use receptacle outlet shall be installed in walls so that no point along the floor line in any wall space is more than 6 feet, measured horizontally, from an outlet in that space, including any wall space 2 feet or more in width and the wall space occupied by sliding panels in exterior walls. A receptacle outlet is required to be located at each kitchen counter 12 inches or more in width and adjacent to each lavatory sink.

Each dwelling unit shall have not less than two small appliance receptacle branch circuits for the supply of receptacle outlets located in the kitchen. Small appliance receptacle outlets are those located in the kitchen, service porch, pantry, laundry room or area, dining room or area, breakfast room or area. Receptacle outlets or branch circuits located in other rooms or areas are considered as convenience receptacle outlets. Small appliance branch circuits shall not supply convenience receptacle outlets, lighting outlets, or fixed appliances. A branch circuit supplying only convenience receptacle outlets may also supply lighting outlets and fixed appliances.

Each dwelling unit shall be provided with an individual 20-ampere branch circuit for a receptacle outlet installed adjacent to a laundry tray or other plumbing suitable for a washing machine.

GROUND-FAULT CIRCUIT INTERRUPTERS

Receptacles installed above the kitchen sink counter tops shall have ground-fault circuit interrupter protection.

Receptacles installed in bathrooms, garages, basements and those installed outdoors shall have ground-fault circuit interrupter protection.

A ground-fault circuit interrupter is a device intended for the protection of personnel. It functions to de-energize a circuit, or portion thereof, within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protection (circuit breaker) device of the supply circuit. In other words, the ground fault circuit interrupter is a very sensitive device that protects a person from receiving an electrical shock, whereas a circuit breaker is a slower acting device that only protects the electrical circuit from burning up.

ARC-FAULT CIRCUIT INTERRUPTERS

All branch circuits that supply 125 volt, single phase, 15 and 20-ampere receptacle outlets installed in dwelling unit bedrooms shall be protected by an Arc Fault Circuit Interrupter.

RESIDENTIAL GARAGE AND BASEMENTS

At least one receptacle outlet, in addition to any provided for laundry equipment, shall be installed in each attached garage, basement, and in each detached garage with electrical power.

All receptacles located inside and on the exterior wall of the garage or basement shall have ground-fault circuit interrupter protection, except for the laundry equipment receptacle.

At least one wall switch-controlled lighting outlet shall be installed in the attached garage or basement and its outdoor entrances.

All 125 volt 15-20 ampere receptacles in a basement shall have ground-fault circuit interrupter protection.

MINIMUM REQUIREMENTS FOR INDIVIDUAL APPLIANCE BRANCH CIRCUITS

| MINIMUM REQUIREMENTS FOR INDIVIDUAL APPLIANCE BRANCH CIRCUITS TABLE | |
|---|-----------------------|
| TYPE OF APPLIANCE | BRANCH CIRCUIT RATING |
| Electrical range | 50 amperes |
| Kitchen counter top small appliance branch circuit | 20 amperes |
| Counter-mounted electric cooking unit | 30 amperes |
| Dishwasher | 15 amperes |
| Garbage Disposal | 15 amperes |
| Sub Panels | 30 amperes |
| Wall-mounted electric oven | 30 amperes |
| Electric clothes dryer | 30 amperes |
| Washing machine or laundry area | 20 amperes |

Appliance branch circuits, including conductors, circuit breakers or fuse holders, switches, and the like shall not supply a load greater than 80 percent of the branch circuit rating.

MINIMUM SIZE SERVICE

1. Single Family Dwelling with 6 or more 2 wire branch circuits 100 amp, #4 THW copper or #2 THW aluminum wire.
2. Single Family Dwelling 100 amp, #4 THW copper wire.
3. Other loads - 60 amps, #6 THW copper or #4 THW aluminum wire.

The service head and meter shall be installed where directed by serving agency and shall be so located that the service drop may be installed with only one point of attachment without crossing over adjacent premises. The service drops for dwellings shall be not less than 10 feet above the ground and provide 12 feet clearance for service drops over private driveways.

Service equipment shall be installed at the nearest readily accessible point to the entrance of the service wires. The maximum height of the service switch or circuit breaker handle shall not exceed 6 feet 6 inches above ground and shall have a clear working space of 3 feet deep and 30 inches wide.

The service raceway enclosure and interior wiring system shall be bonded in an approved manner and the grounding shall terminate in an approved accessible ground clamp attached to a continuous cold water piping system. Bonding jumpers shall be installed where the double lock nut type connection is used. Where cold water system is used as service grounding, a ground rod shall be provided to be driven eight feet vertically into the earth and shall be mechanically bonded to the cold water system in an approved manner.

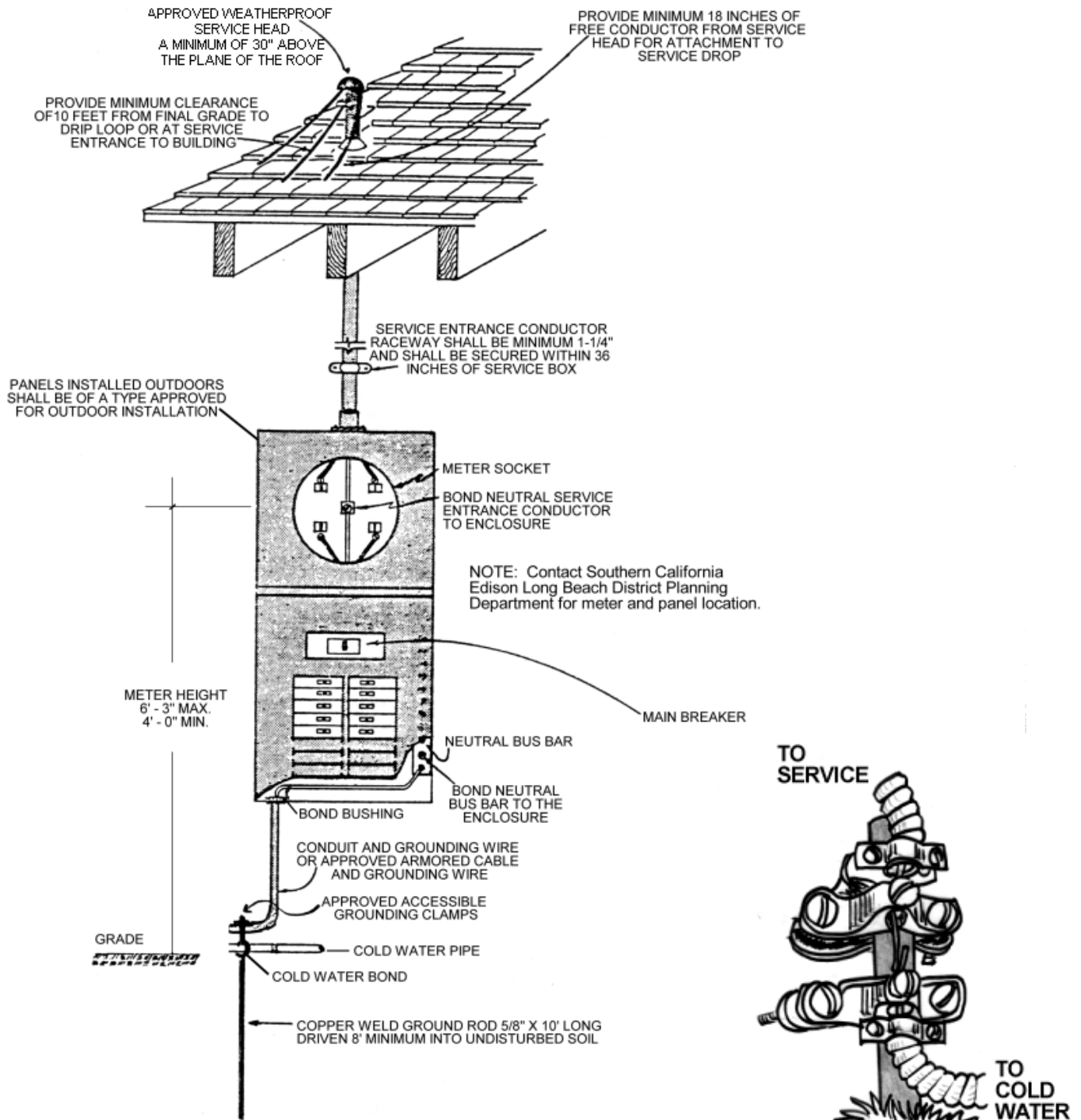
ELECTRICAL DETAILS, DIAGRAMS AND TABLES

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| □ | TYPICAL ELECTRICAL SERVICE DETAIL | Page 83 |
| □ | CONDUCTOR SIZE AND CONDUIT REQUIREMENTS..... | Page 84 |
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CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT

TYPICAL ELECTRICAL SERVICE DETAIL

| SIZE OF GROUNDING AND BONDING WIRES | | |
|-------------------------------------|------------------------------------|---------------------------|
| SERVICE SIZE | LARGEST SERVICE ENTRANCE CONDUCTOR | BONDING OR GROUNDING WIRE |
| 100 AMP | #4 or #3 | #8 AWG |
| 125 AMP | #2 or #1 or 1/0 | #6 AWG |
| 200 AMP | 2/0 | #4 AWG |



Bonding and Grounding Clamp Detail

CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING

CONDUCTOR SIZE AND CONDUIT REQUIREMENTS

MAXIMUM ALLOWABLE CURRENT CARRYING CAPACITY IN AMPERES OF INSULATED CONDUCTORS IN CONDUITS OR CABLES

(TW insulation and not more than three conductors in conduit or cables.)

| Size AWG | Amperes (Copper) | Amperes (Aluminum) |
|----------|------------------|--------------------|
| No. 14 | 15 | - |
| No. 12 | 20 | 15 |
| No. 10 | 30 | 25 |
| No. 8 | 40 | 30 |
| No. 6 | 55 | 40 |
| No. 4 | 70 | 55 |
| No. 2 | 95 | 75 |
| No. 1 | 110 | 85 |
| No. 0 | 125 | 100 |

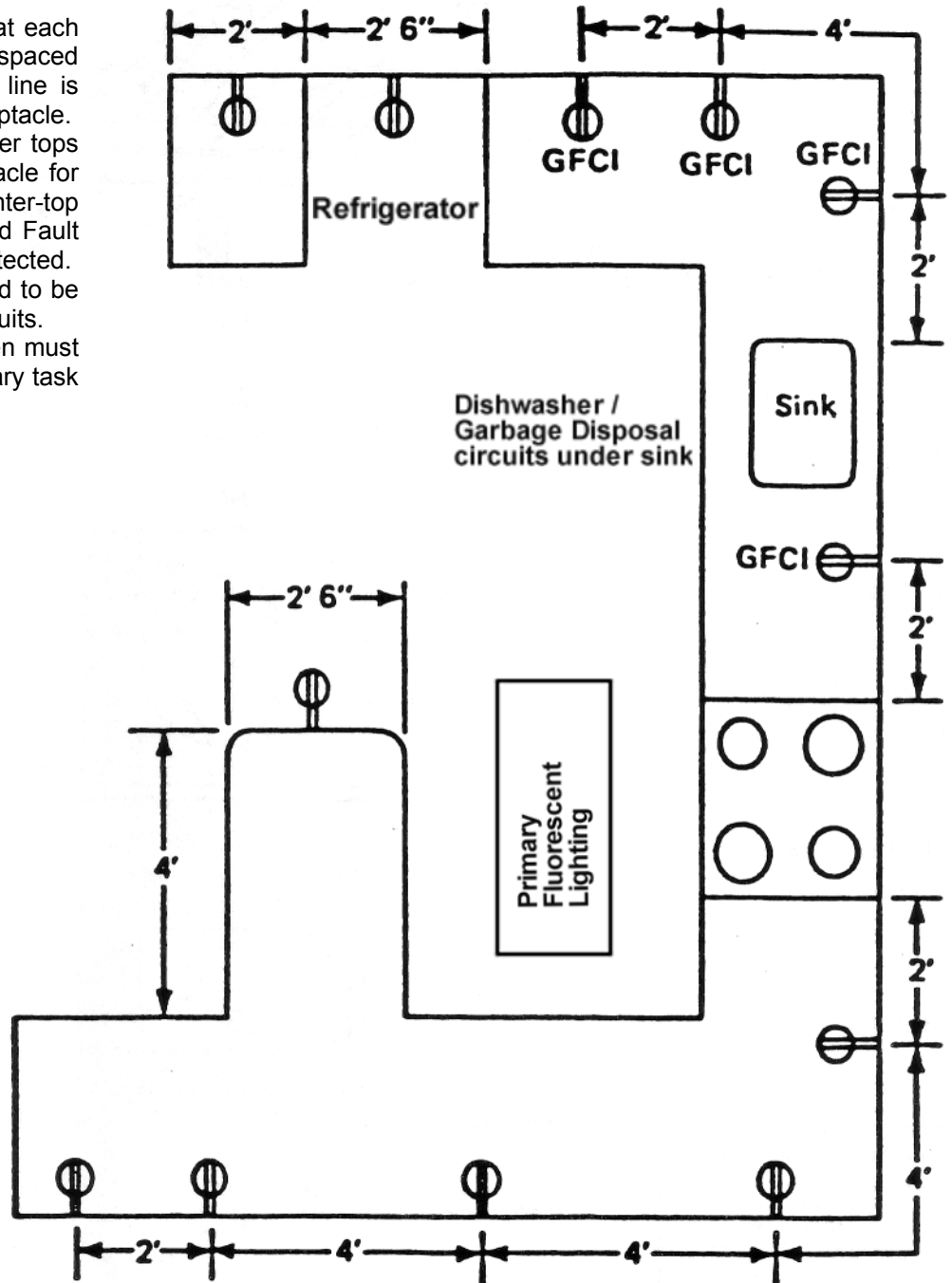
Note: When installing more than three conductors in conduit or cables, see Note 8, Table 310-16 for derating factors (National Electrical Code).

MAXIMUM NUMBER OF TW CONDUCTORS IN CONDUIT OR TUBING

| Size AWG | Conduit or Tubing Size | | | | | |
|----------|------------------------|------|----|--------|--------|----|
| | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 2" |
| No. 14 | 9 | 15 | 25 | 44 | 60 | 99 |
| No. 12 | 7 | 12 | 19 | 35 | 47 | 78 |
| No. 10 | 5 | 9 | 15 | 26 | 36 | 60 |
| No. 8 | 2 | 4 | 7 | 12 | 17 | 33 |
| No. 6 | 1 | 2 | 4 | 7 | 10 | 16 |
| No. 4 | 1 | 1 | 3 | 5 | 7 | 12 |
| No. 2 | 1 | 1 | 2 | 4 | 5 | 9 |
| No. 1 | - | 1 | 1 | 3 | 4 | 6 |
| No. 0 | - | 1 | 1 | 2 | 3 | 5 |

TYPICAL KITCHEN APPLIANCE BRANCH CIRCUITS

Receptacle outlets are required at each counter space wider than 12 in. spaced so that no point along the wall line is more than 24 in. from a receptacle. Island and peninsular type counter tops are required to have one receptacle for each 4 feet of counter-top. Counter-top outlets are required to be Ground Fault Circuit Interrupted (GFCI) protected. Outlets in the kitchen are required to be divided between two 20 amp. circuits. Primary task lighting in the kitchen must be fluorescent, however; secondary task lighting may be incandescent.



| Type of Appliance | Branch Circuit Rating |
|---|-----------------------|
| Electrical range (240V) | 50 amperes |
| Kitchen counter top small appliance branch circuit (120V) | 20 amperes |
| Counter-mounted electric cooking unit (240V) | 30 amperes |
| Dishwasher (120V) | 15 - 20 amperes |
| Garbage Disposal (120V) | 15 amperes |
| Wall-mounted electric oven (240V) | 30 - 40 amperes |
| Microwave (120V) | 20 amperes |
| Trash Compactor (120V) | 15 amperes |

Separate Circuit required for each of the above appliances

CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING
TYPICAL KITCHEN REMODEL

Your Kitchen Today

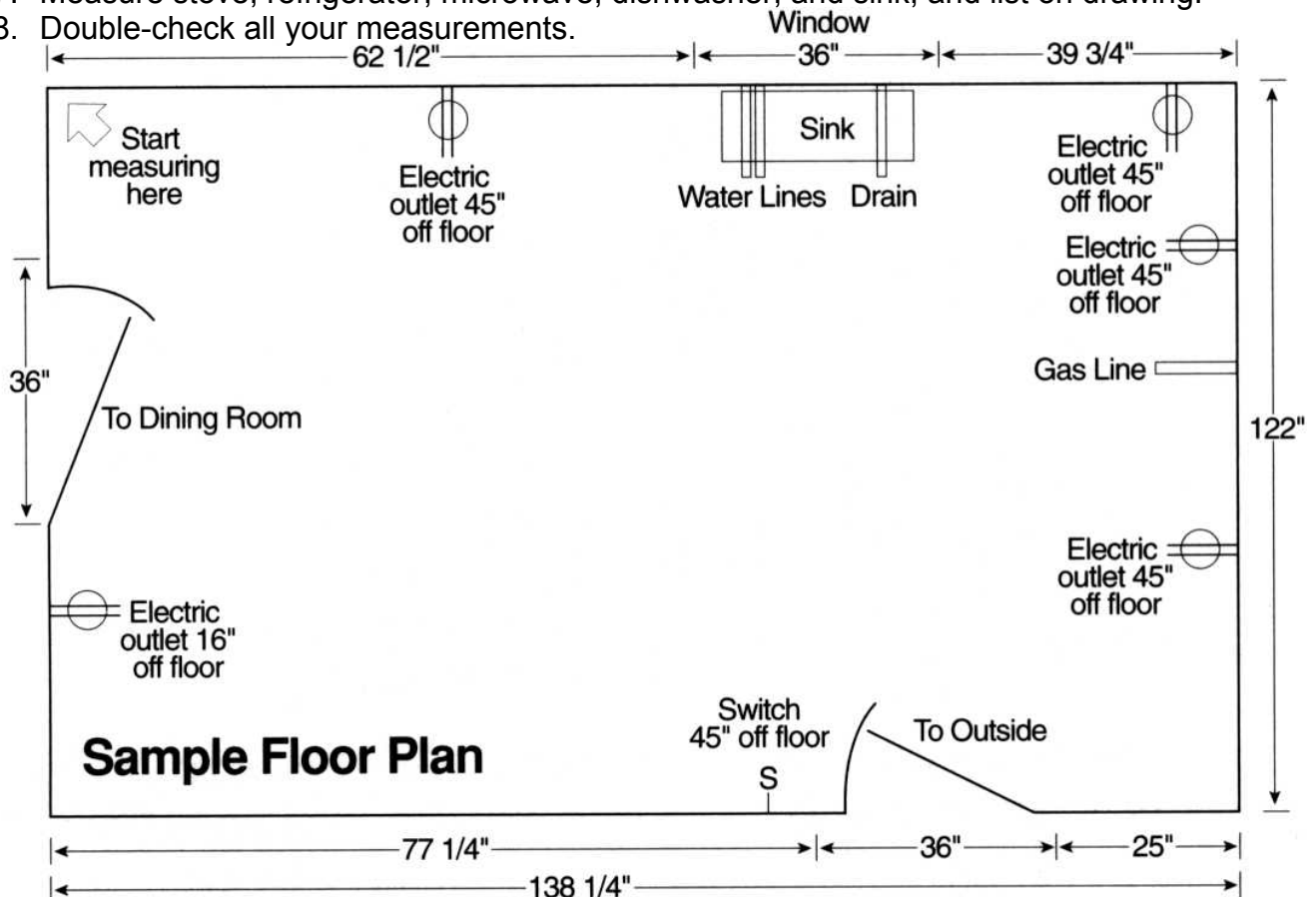
Sketch your kitchen as it looks today. Indicate doorways, windows, cabinets, major appliances, ventilation, electrical outlets, sinks, dishwasher, and other plumbing. It doesn't have to be exact, but draw it to scale as closely as possible. (1/2" equals one foot.) Use these tips to help design your new kitchen.

How To Measure Your Kitchen

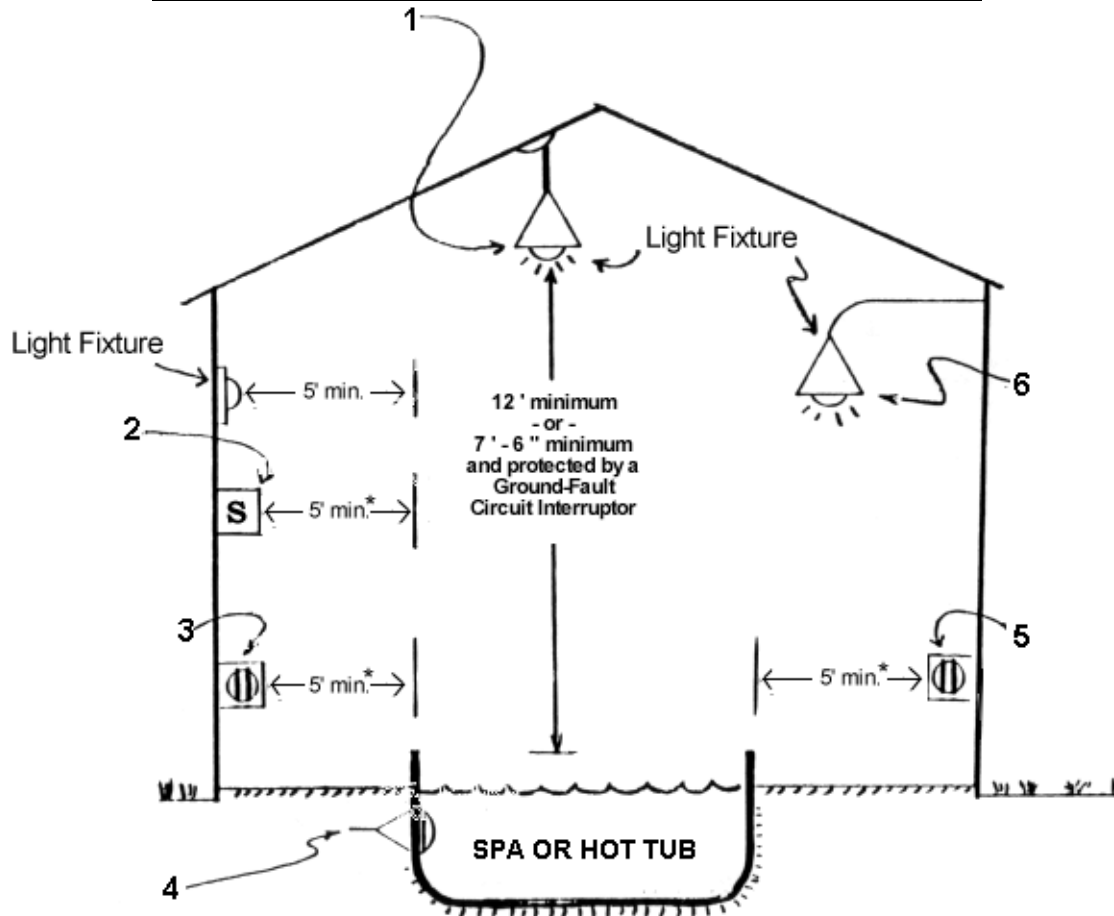
1. Draw a rough sketch of your kitchen.
2. Measure every wall, beginning at the left corner, to the far right corner. Write the total measurements in inches.
3. Measure from left corner to edge of opening, window or door.
4. Measure across opening from trim edge to trim edge.
5. Measure from trim edge to far wall. Compare steps 3, 4, and 5 to step 2. Both totals should agree.
6. Mark exact location of sink, water drain, gas lines, electrical outlets and switches on the drawing. (Measure to the center of these, not the edge.)

Windows and Doors

1. Measure from floor to windowsill.
2. Measure from windowsill to top of window.
3. Measure from top of window to ceiling.
4. Measure from floor to ceiling. Total of steps 7, 8, and 9 should equal this measurement.
5. Measure width of door from trim edge. Indicate position of door swing.
6. Measure remaining three walls; follow steps 2 through 11.
7. Measure stove, refrigerator, microwave, dishwasher, and sink, and list on drawing.
8. Double-check all your measurements.



TYPICAL INDOOR INSTALLATION OF SPA, HOT TUB OR HYDROMASSAGE BATHTUB



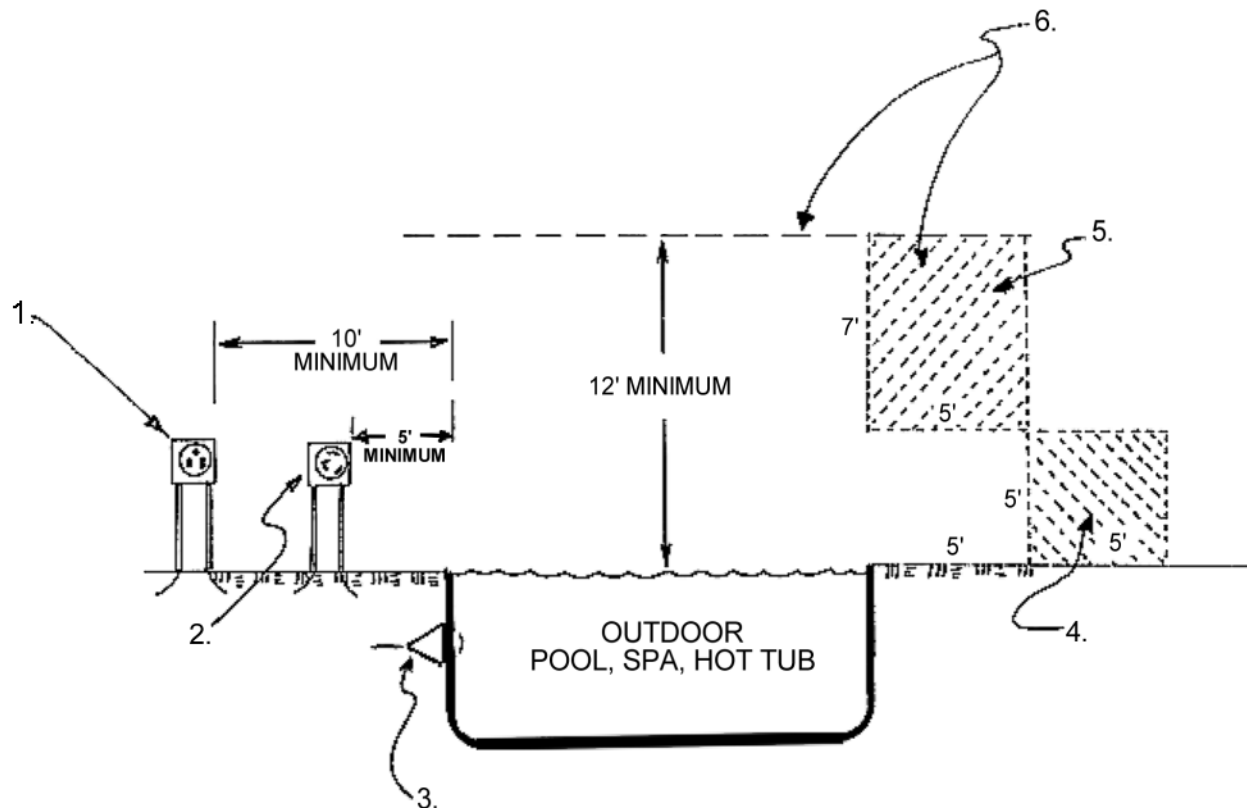
SPA OR HOT TUB

1. All light fixtures or light outlets located directly over the spa or hot tub, shall have a minimum clearance of seven feet and six inches (7' 6") and shall be protected by a Ground-Fault Circuit-Interrupter (GFCI), OR, shall have a minimum clearance of twelve feet (12') above the spa or hot tub.
2. Switches shall be located at least five feet (5'), measured horizontally, from the inside walls of the spa or hot tub.
3. A Ground-Fault Circuit-Interrupter shall protect receptacles that provide power for a spa or hot tub. Receptacles on the property shall be located at least five feet (5') from the inside walls of the spa or hot tub.
4. Underwater light fixtures shall comply with Part B, Article 680 of the National Electrical Code.
5. 125-volt receptacles located within ten feet (10') of the inside walls of a spa or hot tub shall be protected by a Ground-Fault Circuit-Interrupter.
6. All light fixtures or light outlets located within five feet (5') from the inside wall of the spa or hot tub shall have a minimum clearance of seven feet and six inches (7' 6") above the spa or hot tub and shall be protected by a Ground-Fault Circuit-Interrupter, OR, shall have a minimum clearance of twelve feet (12') above the spa or hot tub.

HYDROMASSAGE BATHTUB

Hydromassage bathtubs and their associated electrical equipment are required to be G.F.C.I. protected. All receptacles in the bathroom must be G.F.C.I. protected. All receptacles within 5 feet of hydromassage bathtub must be G.F.C.I. protected. In an existing bathroom where a hydromassage bathtub is installed, an existing wall switch and/or receptacle shall be permitted when protected by a Ground-Fault Circuit-Interrupter. No part of cord-connected fixtures, hanging fixtures, or pendants shall be located within a zone measured 3 feet horizontally and 8 feet vertically from the top of the bathtub rim. This zone is all encompassing and includes the zone directly over the tub.

CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING
**TYPICAL OUTDOOR INSTALLATION OF POOL,
SPA OR HOT TUB**



1. For permanent installations at dwelling units, it is mandatory to install a 125-volt receptacle a distance of ten to twenty feet from the inside wall of the pool, spa, or hot tub. The receptacles shall be protected with a Ground-Fault Circuit-Interrupter.
2. Locking and grounding type receptacle for power to recirculating pump motor shall be protected with a Ground-Fault Circuit-Interrupter.
3. The following pool, spa, or hot tub parts shall be bonded: All metallic parts of the structure, all forming shells, metal fittings within or attached, metal parts of electrical equipment of the water system. Metal conduit, metal pipe, metal surfaces, electrical devices, controls, all of which are within five feet (5') of the inside wall of the pool, spa or hot tub.
4. Light fixtures and light outlets in the area extending between five feet and ten feet horizontally from the inside wall and less than five feet above the maximum water level, shall be protected by a Ground-Fault Circuit-Interrupter. Switching devices on the property shall be located at least five feet from the inside walls of the pool spa or hot tub, unless separated from the pool, spa or hot tub, by a solid fence, wall, or other permanent barrier.
5. Existing light fixtures and light outlets are only permitted within five feet horizontal distance of the inside walls of the pool, spa, or hot tub. Also fixtures shall be rigidly attached to the existing structure and located at least five feet above the pool, spa or hot tub.
6. Light fixtures and light outlets shall not be installed over the pool, spa, or hot tub, or over the area extending five feet horizontally from the inside walls of the pool, spa or hot tub, unless located at least twelve feet above the maximum water level.

PLUMBING

GENERAL

Permits are required before starting work. Permits are available to owners of single-family dwellings and duplexes provided the owner or a member of the immediate family installs the work, and the owner resides or intends to reside in such dwelling.

Permits become null and void if such work authorized is not commenced within 180 days of issuance, or if such work is suspended or abandoned at any time after the work is commenced for a period of 180 days.

All work shall comply with the Uniform Plumbing Code and the Plumbing Regulations of the Long Beach Municipal Code.

No work shall be covered without first having been inspected and approved.

WHO CAN OBTAIN PERMITS?

Permits shall be issued to duly licensed contractors. However, a homeowner can obtain a permit to do the construction, alteration or repair of a one or two-family dwelling and accessory buildings or facilities thereto if:

1. The owner resides or intends to reside in the dwelling, showing proof of residence;
2. The plumbing work is performed by the owner, and
3. The owner signs a statement that no person will be employed in a manner as to become subject to the workers' compensation laws of the State of California. When a permit is taken out, the signature and identity of the applicant must be verified. A California Driver's License, State of California Identification Card, or other positive identification will meet this requirement. Contractors working in the City of Long Beach are required to have a Long Beach business license. If a contractor has employees, proof of Workers' Compensation Insurance must be shown at the time of permit issuance. Contractors working alone may waive this requirement, but must show a pocket copy of their State Contractor's License.

WHEN IS A PERMIT REQUIRED?

1. Before any plumbing is commenced, a permit authorizing the quality and character of the workmanship and materials of such work shall be obtained from the Building Official to do so.
2. A plumbing permit shall be obtained for each separate building, except that one permit fee only shall be required for plumbing to be installed in a dwelling and accessory buildings located on the same lot or premises, and which such accessory building does not contain sleeping quarters, or house more than two passenger-carrying automobiles, provided, that such plumbing is installed at the same time as the plumbing with the accompanying dwelling.
3. Exception: A separate plumbing permit shall not be required for any plumbing work involving a Group R, Division 3 or Group U occupancy for which a combined permit has been obtained.

No permit shall be required in the following cases:

1. The stopping of leaks or the repair of defects in any plumbing, provided that no new materials are used;

2. The repair of a water heater other than its vents; provided that the water heater is not disconnected;
3. The replacement of exposed traps serving fixtures, provided that approved traps are used and are properly installed;
4. The replacement of defective or unapproved ball-cocks in water tanks, provided anti-siphon ball-cocks are used and properly installed;
5. The replacement of defective or unapproved faucets serving sinks, lavatories and bathtubs, provided approved type faucets are used and are properly installed;
6. The replacement of an electric water heater, providing the rough plumbing is not altered. Any gas piping not more than six feet in length between an approved gas outlet and any gas-fired appliance, provided that any such gas-fired appliance is in the same room as the gas outlet.

INSPECTIONS REQUIRED

Concealing of work:

No person shall fail, neglect or refuse to leave and keep any plumbing, as regulated by this chapter, open, uncovered and convenient for inspection until such plumbing has been inspected and approved by the Building Official or an authorized Plumbing Inspector, and any obstruction whatsoever, which interferes with a complete and thorough inspection of any plumbing, shall be removed upon notice so to do, and shall be left and kept removed until such plumbing has been inspected and approved.

DRAINAGE OF VENTS

Under slab or underground drainage and vent piping within a dwelling must be cast iron soil pipe, approved plastic or type "DWV" copper tube. Drainage and vent piping installed more than 6 inches above ground or concrete may be galvanized steel pipe. Drainage piping must slope or grade at least 1/4 inch per foot.

The aggregate area of vents through the roof must equal the size of the building drain.

Plumbing fixtures must be an approved type and must be properly trapped and vented.
(See "Typical Waste and Vent System" detail on page 97.)

WATER PIPING

Galvanized steel water piping shall **not** be installed in the ground under a building, unless it is protected against corrosion by a machine applied coating or wrapping.

PVC water lines are not approved under or within buildings.

Copper tubing type L or heavier may be used in all locations. All joints installed below the floor slab shall be brazed.

Copper tubing type M or heavier may be used in the ground outside and within the building walls and attic.

The size of each section of water piping system is determined from a combination of:

1. The minimum pressure available in the main.
2. The elevation of the highest outlet.
3. The distance to the most remote outlet.

4. The number of outlets supplied.

Exterior and interior hose water faucets and laundry sink type water faucets shall be protected by an approved non-removable type back-flow prevention device.

GAS PIPING

Gas piping may **not** be installed underneath the raised floor of a building when the gas line is in the ground or under/within a concrete floor slab of a building. The gas pipe can be attached to the raised wood floor joists minimum 6 inches above grade.

Gas piping shall **not** be installed in the ground unless it is protected against corrosion by a machine applied coating or wrapping.

Unions for gas pipe are only permitted at an exposed fixture appliance or equipment connection and in exposed exterior locations immediately on the discharge side of a building shut off valve.

The distance from the meter to the most remote outlet plus the gas demand of the appliance served determines the size of each section of gas piping system.

Once all gas pipes has been installed, perform an air pressure test on the new gas system. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening, and, after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of 10 pounds per square inch. The pressure shall be held without induction of additional air for a period of at least 15 minutes. **(See “Test for Low Pressure Gas Systems” on page 99.)**

WATER HEATERS – PROHIBITED LOCATIONS

1. Water heaters which depend on the combustion of fuel for heat shall not be installed in any room used or designed to be used for sleeping purposes, bathroom, clothes closets, or in any closet or other confined space opening into any bath or bedroom.
2. Shed clearance to side property line is 2 feet 6 inches and 3 feet to rear property line. Verify approved location of the water heater with the Zoning counter staff.
3. The termination of Type “B” vents shall be a minimum of 4 feet from the property line.

TESTING AND INSPECTION

All work must be inspected and approved before being covered, concealed, or put into use. All tests must be witnessed by the inspector.

Building sewers shall be tested by plugging the end of the building sewer at its point of connection with the public sewer and completely filling the building sewer with water from the lowest to the highest point.

Drainage, and vent systems must be tested by filling with water and must be watertight. No section shall be tested with less than a ten (10) foot head of water.

Water piping must withstand the street main pressure or 50 p.s.i of air pressure without leaking.

Metallic gas piping must withstand 10 p.s.i. air pressure for at least 15 minutes without leaking.

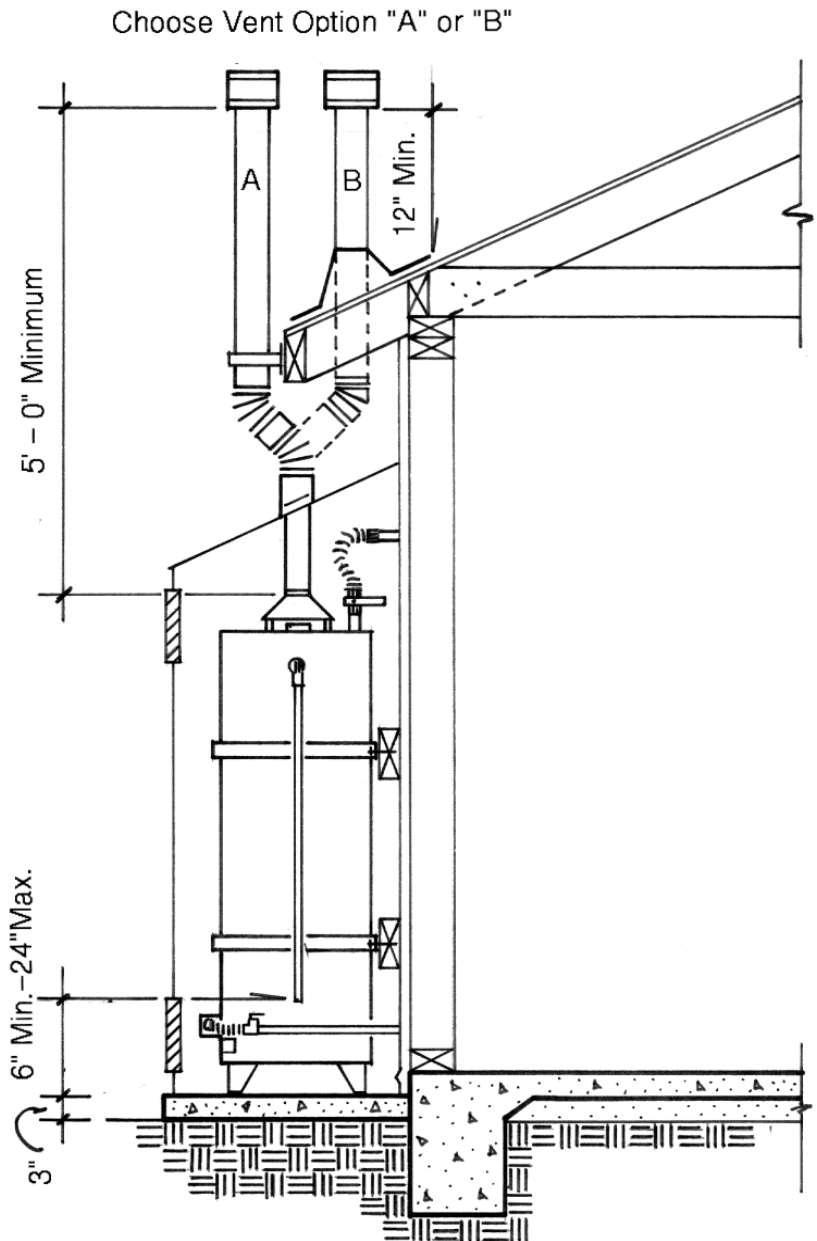
PLUMBING DETAILS, DIAGRAMS AND TABLES

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TYPICAL INSTALLATION OF WATER HEATER **IN METAL SHED**

INSTALLATION CHECKLIST

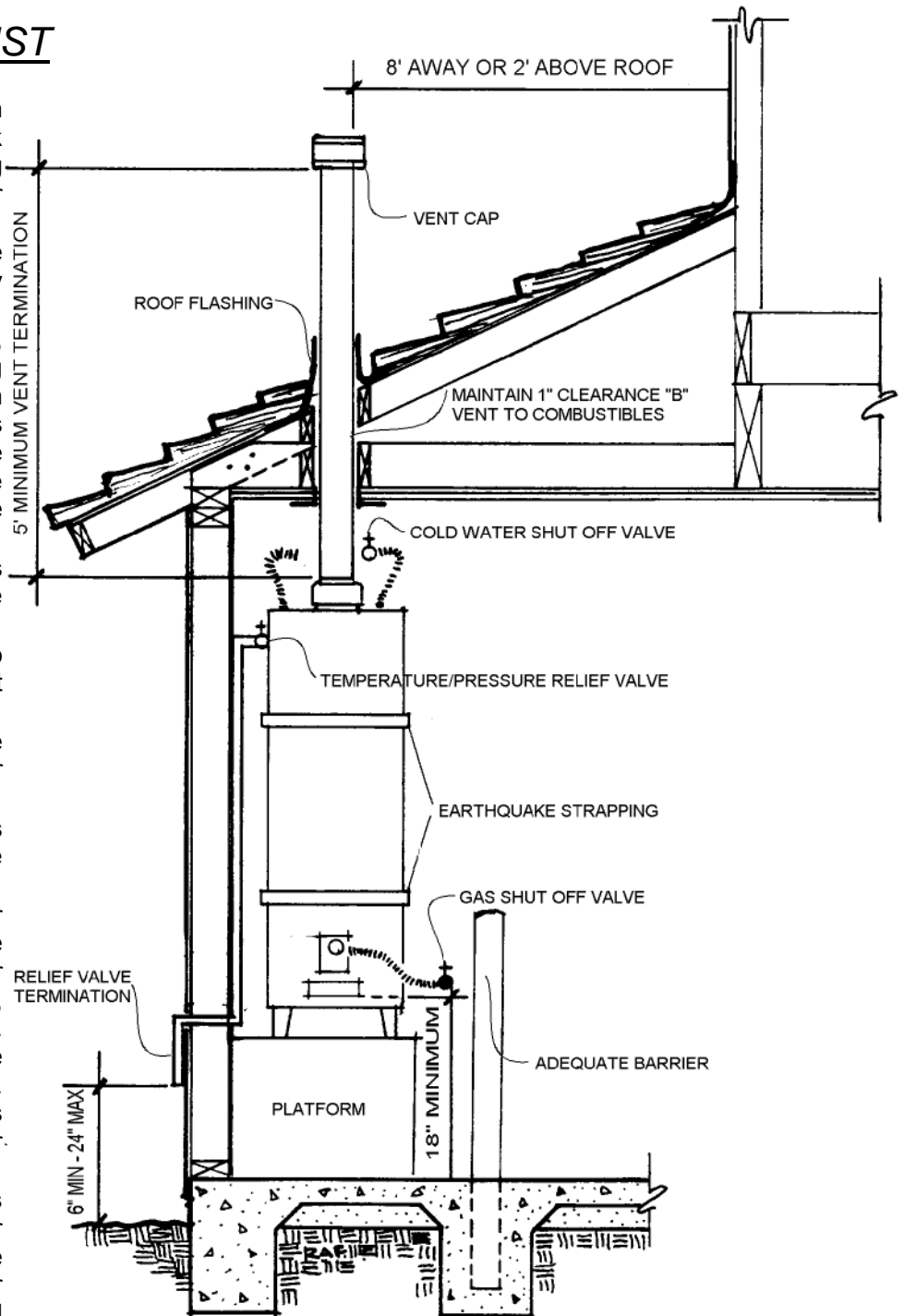
- ☐ Shed clearance to side property line is 2 feet 6 inches and 3 feet to rear property line. Verify approved location with staff at the Planning counter.
- ☐ Termination of "B" vent shall be minimum 4 feet from the property line. Gravity vents shall extend in a generally vertical direction with offsets not exceeding 45 degrees.
- ☐ Double wall type "B" vent requires minimum 1" clearance to combustible materials. Double wall vent is required outside of the enclosure.
- ☐ Single wall vent connector must be secured to down draft diverter and "B" vent with sheet metal screws.
- ☐ A cold water shut off valve shall be installed for the service or replacement of the water heater.
- ☐ Approved flexible water connectors are approved for water supply to heater within the enclosure only.
- ☐ A combustion air opening in an exterior wall of 1 sq. in. per 4000 Btu rating of water heater is required within the upper and lower 12 inches of the enclosure.
- ☐ A pressure/temperature relief valve is required to be installed on the water heater. Terminate the discharge line of the relief valve no more than 2 feet, nor less than 6 inches above the ground. The end of the discharge line may not be threaded.
- ☐ The water heater shall be anchored or strapped with approved materials to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper (1/3) one third and lower (1/3) one third of its vertical dimension. At the lower point, a minimum distance of 4 inches shall be maintained above the controls with the strapping.
- ☐ An approved gas shut-off valve is required to be installed at the gas piping outlet, immediately ahead of the flex connector, and must be accessible.
- ☐ A gas flex connector is limited to 3 feet in length.
- ☐ An air pressure test is required for installation of new a gas line if the new line exceeds 6 feet. The test consists of pumping air into the new line to a pressure of 10 pounds per square inch for a period of 15 minutes without loss of pressure. The test must be witnessed by an inspector.



TYPICAL INSTALLATION OF WATER HEATER IN GARAGE

INSTALLATION CHECKLIST

- ☐ Establish location of water heater in garage. The location may not block existing required off-street parking areas. Establish the best location for the installation of water heater vent.
- ☐ Termination of AB \equiv vent shall be minimum 4 feet from the property line.
- ☐ Water heaters generating a glow, spark or flame capable of igniting flammable vapors may be installed in a garage, provided the pilots, burners or heating elements and switches are at least eighteen (18) inches above the floor level. Provide an adequate platform to elevate the water heater.
- ☐ Double wall type AB \equiv vent requires minimum 1" clearance to combustible materials.
- ☐ Type AB \equiv vent must be secured to the down draft diverter with sheet metal screws.
- ☐ A cold water shut-off valve shall be installed for the service or replacement of the water heater.
- ☐ Approved flexible water connectors are approved for water supply to the heater within the garage only.
- ☐ Provide combustion air for water heater. If the volume of the garage equals at least fifty (50) cubic feet per 1000 Btu/h input of the water heater, no additional openings are needed. If not, combustion air openings in the exterior wall of the garage of 1sq. In. per 4000 Btu rating of water heater is required within the upper and lower 12 inches of the garage.
- ☐ A pressure/temperature relief valve is required to be installed on the water heater. Terminate the discharge line of the valve no more than 2 feet, nor less than 6 inches above the ground outside of the building.
- ☐ The water heater shall be anchored or strapped with approved materials to resist horizontal displacement due to earthquake motion.
- ☐ Provide air pressure test on the new gas system.



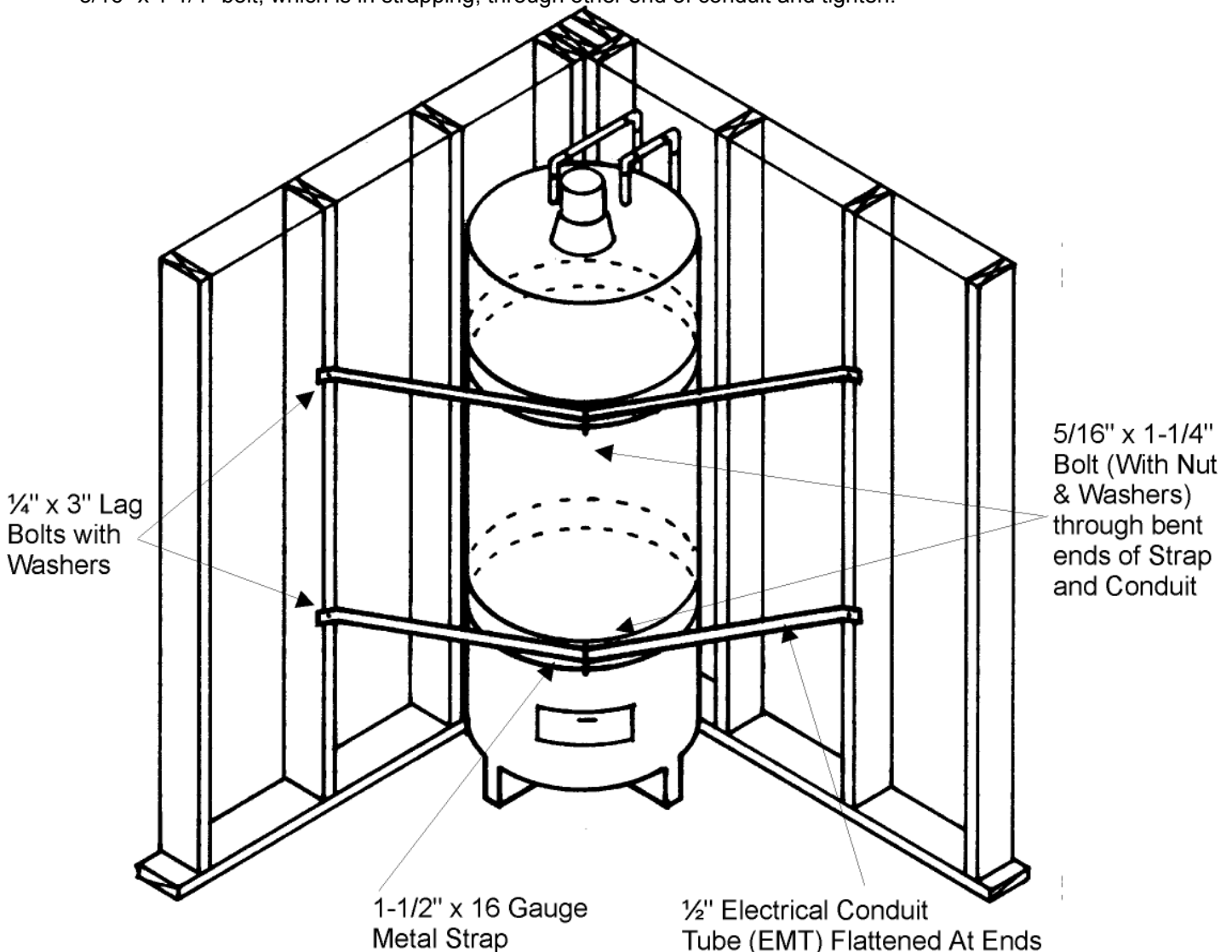
EARTHQUAKE RESTRAINT DESIGN FOR WATER HEATERS UNDER 100 GALLONS

The illustration below shows the strapping requirements for water heaters up to 40 gallons within 12 inches of a stud walls. For water heaters over 40 gallon but less than 100 gallons, use ¾ inch EMT conduit and 1-1/2 inch metal strap. Water heaters over 100 gallons and/or water heaters more than 12 inches from a wall require a designed system.

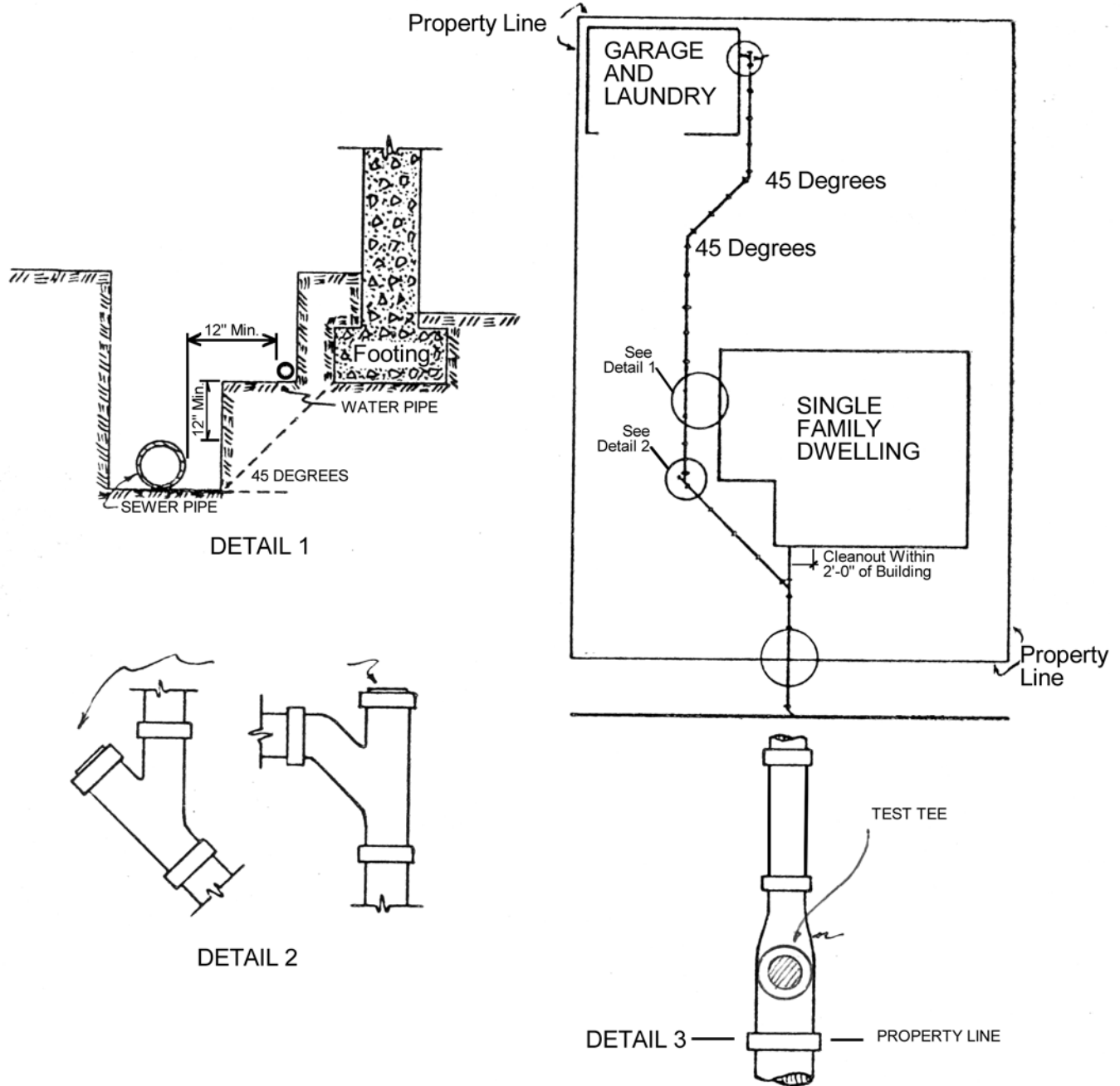
NOTE: Approved manufactured water heater support kits sold at building and plumbing supply stores may be used as an alternate to these requirements.

INSTALLATION CHECKLIST

- ❑ Locate wall studs on both sides of the water heater. Pre-drill holes for anchor bolts in stud center.
- ❑ Measure distance around water heater. Cut two 1-1/2"x16 gauge straps to encompass water heater.
- ❑ Drill holes in the ends of the straps and bend them 45 degrees.
- ❑ Cut four pieces of ½" EMT conduit to the proper length as shown in diagram and flatten ends.
- ❑ Drill holes in flattened ends of conduit. Bend flattened ends 45 degrees on one side.
- ❑ Install strapping. Strapping shall be located at points within the upper and lower (1/3) one third of the vertical dimension of the water heater. At the lower point, a minimum distance of 4 inches shall be maintained above the controls. Wrap the straps around the heater and insert a 5/16" x 1-1/4" bolt with washer into the bent ends.
- ❑ Install EMT conduit. Insert ¼" x 3" lag bolts through hole in ends of conduit into the wall stud and tighten. Insert 5/16" x 1-1/4" bolt, which is in strapping, through other end of conduit and tighten.



CITY OF LONG BEACH
PLANNING AND BUILDING DEPARTMENT
TYPICAL ON-LOT SEWER DETAIL



Building sewers:

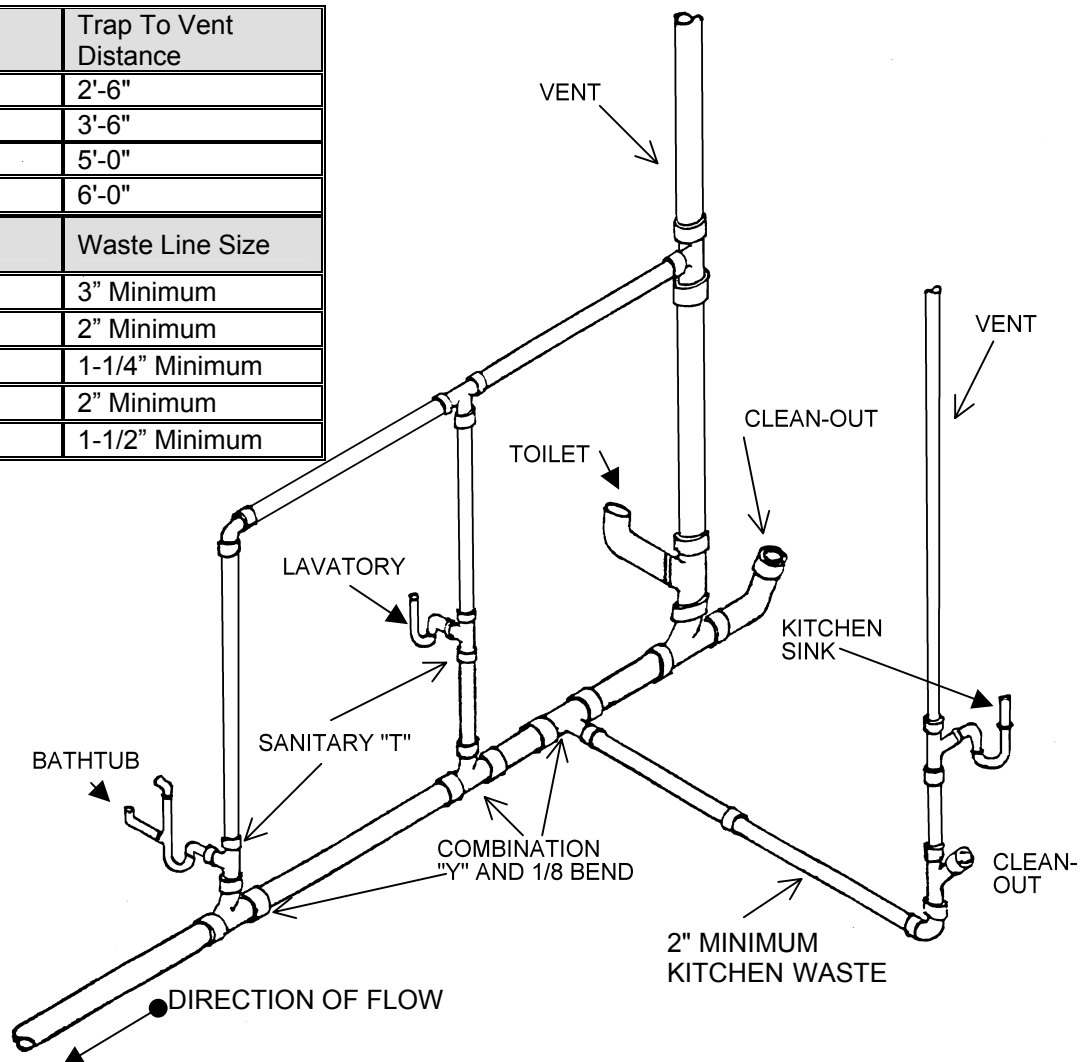
1. shall be located only on the lot which they serve.
2. shall be 3" minimum diameter and 12" below ground if nonmetallic.
3. shall not be nonmetallic when within 2'-0" of any building except approved plastics.
4. shall not be joined by means of cement mortar joints.
5. shall be supported on a firm bed throughout their entire length.
6. shall have a $\frac{1}{4}$ " per foot slope toward the street sewer.

7. shall be provided with a cleanout at their upper terminal, of changes in direction in excess of 135° and at intervals of not to exceed 100' in straight runs.
8. shall not be located in the same ditch with domestic water piping unless the water piping rests on a solid shelf 12" to one side and 12" above the sewer if clay sewer is used. **See Detail 1.**
9. shall not be located in an excavation which is deeper than the bottom of a parallel foundation unless the bottom edge of the excavation is at least one foot away from the foundation for each foot of excess depth. **See Detail 1.**

TYPICAL PLUMBING WASTE AND VENT SYSTEM

- ❑ Vertical drainage lines connecting with horizontal drainage lines shall enter through 45 degree wye branches, combination wye and 1/8 bend branches, or other approved fittings of equivalent sweep.
- ❑ Horizontal drainage lines connecting with other horizontal drainage lines shall enter through 45 degree wye branches, combination wye and 1/8 bend branches, or other approved fittings of equivalent sweep.
- ❑ Horizontal drainage lines, connecting with a vertical stack, shall enter through 45-degree wye branches, 60-degree wye branches, combination wye and 1/8 bend branches, sanitary tee branches, or other approved fittings of equivalent sweep.
- ❑ Horizontal trap arms, connecting with a vertical stack or waste, shall enter through sanitary tee branches. A trap arm is that portion of a fixture drain between a trap and a vent. See table below for horizontal trap arm distances.
- ❑ The size of vent piping shall be determined from its length and the total number of fixture units connected thereto. In addition, the drainage piping of each building and each connection to a public sewer shall be vented by means of one or more vent pipes, the aggregate cross-sectional area of which shall not be less than that of the largest building sewer.

| Trap Arm Pipe Size | Trap To Vent Distance |
|--------------------|-----------------------|
| 1-1/4" | 2'-6" |
| 1-1/2" | 3'-6" |
| 2" | 5'-0" |
| 3" | 6'-0" |
| Fixture | Waste Line Size |
| Toilet | 3" Minimum |
| Kitchen Sink | 2" Minimum |
| Lavatory | 1-1/4" Minimum |
| Shower | 2" Minimum |
| Bathtub | 1-1/2" Minimum |



CITY OF LONG BEACH
DEPARTMENT OF PLANNING AND BUILDING
SPECIAL VENTING FOR ISLAND FIXTURES

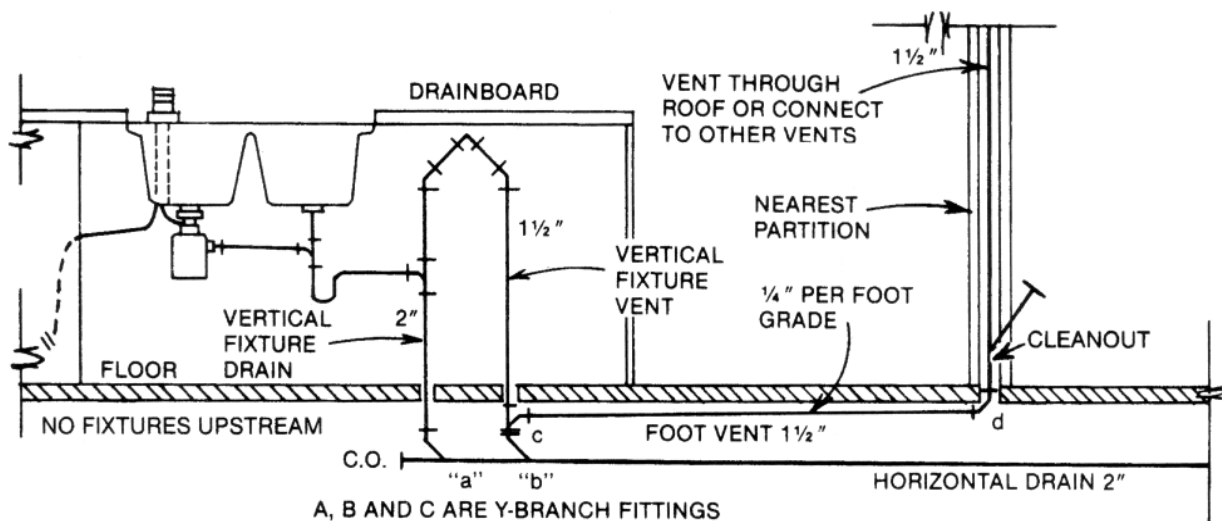
Traps for island sinks and similar equipment shall be roughed in above the floor and may be vented by extending the vent as high as possible, but not less than drainboard height. The vent is then returned downward and connected to the horizontal sink drain immediately downstream from the vertical fixture drain. The drawing below illustrates the construction of the completed island venting system.

The returned vent shall be connected to the horizontal drain through a wye branch fitting, (see "b" in the figure below) and shall in addition be provided with a foot vent taken off the vertical fixture vent by means of a wye branch fitting immediately below the floor. This foot vent extends to the nearest partition and thence through the roof to the open air, or may be connected to other vents at a point not less than (6) inches (152.4 mm) above the flood level rim of the fixture served.

Drainage fittings shall be used on all parts of the vent below the floor line. This includes fittings noted as a, b, c, and d in the illustrations. The foot vent shall maintain a minimum slope of one-quarter inch per foot back to the drain. The return bend used under the drain-board shall be a one-piece fitting, or an assembly of a 45-degree (0.79 radius), a 90-degree (1.6 radius), and a 45-degree (0.79 radius) elbow in the order named. Pipe sizing shall be as elsewhere required in the Code. The figure below shows the minimum pipe sizes required.

Special venting for island fixtures is a method for venting a fixture in an isolated location where vent pipes installed as normally required in UPC Chapter 9 would not be practical.

The specific method for developing this method was closely detailed and explained because too often plumbers and owner-builders allow incomplete island venting to be installed. The installation of the required foot vent with its termination above the roof or properly connected to other vents is inseparable to the completed system. This is the Code-accepted method, and includes all of the necessary elements.



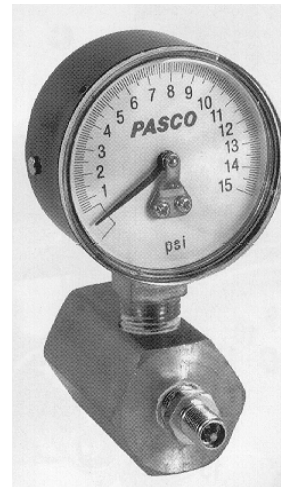
TEST FOR LOW PRESSURE GAS SYSTEMS

GAS TEST CHECKLIST

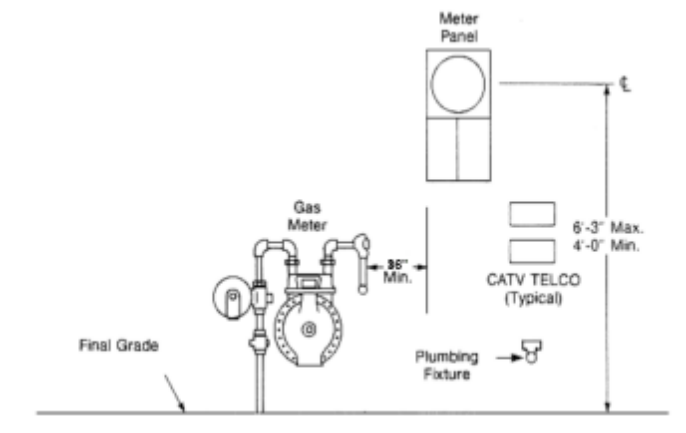
- ☐ Obtain a plumbing permit for installation of new gas pipe over 6 feet in length. A permit is not required for gas piping not more than 6 feet in length between an approved gas outlet and any gas-fired appliance, provided that any such gas-fired appliance is in the same room as the gas outlet.
- ☐ If the gas meter needs to be relocated due to an addition or alteration to an existing building, call the Long Beach Gas Department Inspection Division. A Gas Department Inspector will establish the new location of the gas meter.
- ☐ No gas piping shall be installed in or on the ground under any building or structure and all exposed gas piping shall be kept at least 6" inches above grade or structure.
- ☐ Ferrous gas piping installed underground in exterior locations shall be protected from corrosion by approved factory coatings. All gas pipe protective coatings shall be machine applied. Apply listed primer and spirally wrap listed tape to provide protection to those fittings and short sections where the factory coating has been damaged or stripped for threading. Use minimum 10-mil tape stretched around the fittings and unprotected areas to provide a minimum 40-mil thickness. All horizontal metallic piping shall have at least 12 inches of earth cover. Call for inspection before covering pipe.
- ☐ The gas test shall be performed after all gas piping authorized by the permit has been installed, and before any such piping has been covered or concealed.
- ☐ All gas appliance connectors shall be removed from the gas piping that is to be tested. Pressure necessary to test gas system will damage the gas appliances.
- ☐ Remove gas shut-off valves from all gas pipe outlets after gas system has been shut off at meter. Cap all other inlets and outlets to the system. Gas shut-off valves will not hold pressure for the gas test.
- ☐ Required air pressure tests of 10 pounds or less for low pressure gas systems shall be performed utilizing dial gauges of 1/10 pound incrementation or less. A 15-pound test gauge is most commonly used, however a maximum 20-pound gauge would be acceptable as well.
- ☐ Install air pressure test dial gauge on gas pipe. Apply pipe dope or Teflon tape on pipe threads to ensure a proper seal.
- ☐ Perform air pressure test. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening, and, after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of 10 pounds per square inch. The pressure shall be held

without induction of additional air for a period of at least 15 minutes. **NOTE: Never fill the gas system with water.**

- ☐ If the gas piping system does not hold the required 10 pounds of pressure for 15 minutes, check the gas piping system for leaks. Leaks in gas piping shall be located by applying soapy water to the exterior of the piping when the gas piping system is under pressure. If a leak is present, the soapy solution will bubble. It shall not be permissible to repair defects in gas piping or fittings, but upon having been located, the defective pipe or fitting shall be removed and replaced with sound material.
- ☐ After the gas piping system has been tested and holds pressure to pass the required test, call for final piping inspection. The inspector will witness the gas pressure test, and if the installation is found to comply, will approve the installation of the gas piping system. The inspector will then notify the Gas Department of the approval. The Long Beach Gas Department will then provide service.



Typical Gas Gauge



Gas Inlet Location

MECHANICAL

GENERAL

Permits are required before starting work. Permits are available to owners of single-family dwellings and two family dwellings provided the owner or a member of the immediate family installs the work, and the owner resides or intends to reside in such dwelling.

Permits become null and void if work authorized is not commenced within 180 days of the issuance or if such work is suspended or abandoned at any time after the work is commenced for a period of 180 days.

All work shall comply with the Uniform Mechanical Code and the Mechanical Regulations of the Long Beach Municipal Code.

No work shall be covered or energized without first having been inspected and approved.

It is recommended that spare electrical capacity be installed initially to allow for the addition of future electrical appliances at minimum costs.

WHO CAN OBTAIN PERMITS?

Permits shall be issued to duly licensed contractors. However, a homeowner can obtain a permit to do the construction, alteration or repair of a one or two-family dwelling and accessory buildings or facilities thereto if:

1. The owner resides or intends to reside in the dwelling, showing proof of residence;
2. The mechanical work is performed by the owner, and
3. The owner signs a statement that no person will be employed in a manner as to become subject to the workers' compensation laws of the State of California. When a permit is taken out, the signature and identity of the applicant must be verified. A California Driver's License, State of California Identification Card, or other positive identification will meet this requirement. Contractors working in the City of Long Beach are required to have a Long Beach business license. If a contractor has employees, proof of Workers' Compensation Insurance must be shown at the time of permit issuance. Contractors working alone may waive this requirement, but must show a pocket copy of their State Contractor's License.

WHEN A PERMIT IS NEEDED?

Required:

1. No person shall install, alter, reconstruct or repair any heating, ventilating, cooling, or refrigeration equipment unless a permit therefor has been obtained from the Building Official except as otherwise provided in this code.
2. A permit shall be obtained for all heating, ventilating, cooling, or refrigeration equipment, moved with, or installed in, any relocated building. A separate permit shall be obtained for the equipment installed in each separate building or structure.

Exception:

1. A separate mechanical permit shall not be required for any mechanical work involving a Group R, Division 3 or Group M Occupancy for which a combined permit has been obtained pursuant to Section 18.12.010. A permit shall not be required for the following:

- ❑ Any portable heating appliance;
- ❑ Any portable ventilating equipment;
- ❑ Any portable cooling unit;
- ❑ Any steam, hot, or chilled water piping within any heating or cooling equipment regulated by this code;
- ❑ Replacement of any component part or assembly of an appliance which does not alter its original approval and complies with other applicable requirements of this code;
- ❑ Any portable evaporative cooler;
- ❑ Any refrigerating equipment which is a part of the equipment for which a permit has been issued pursuant to the requirements of this code;
- ❑ Any unit refrigerating system.

INSPECTIONS REQUIRED

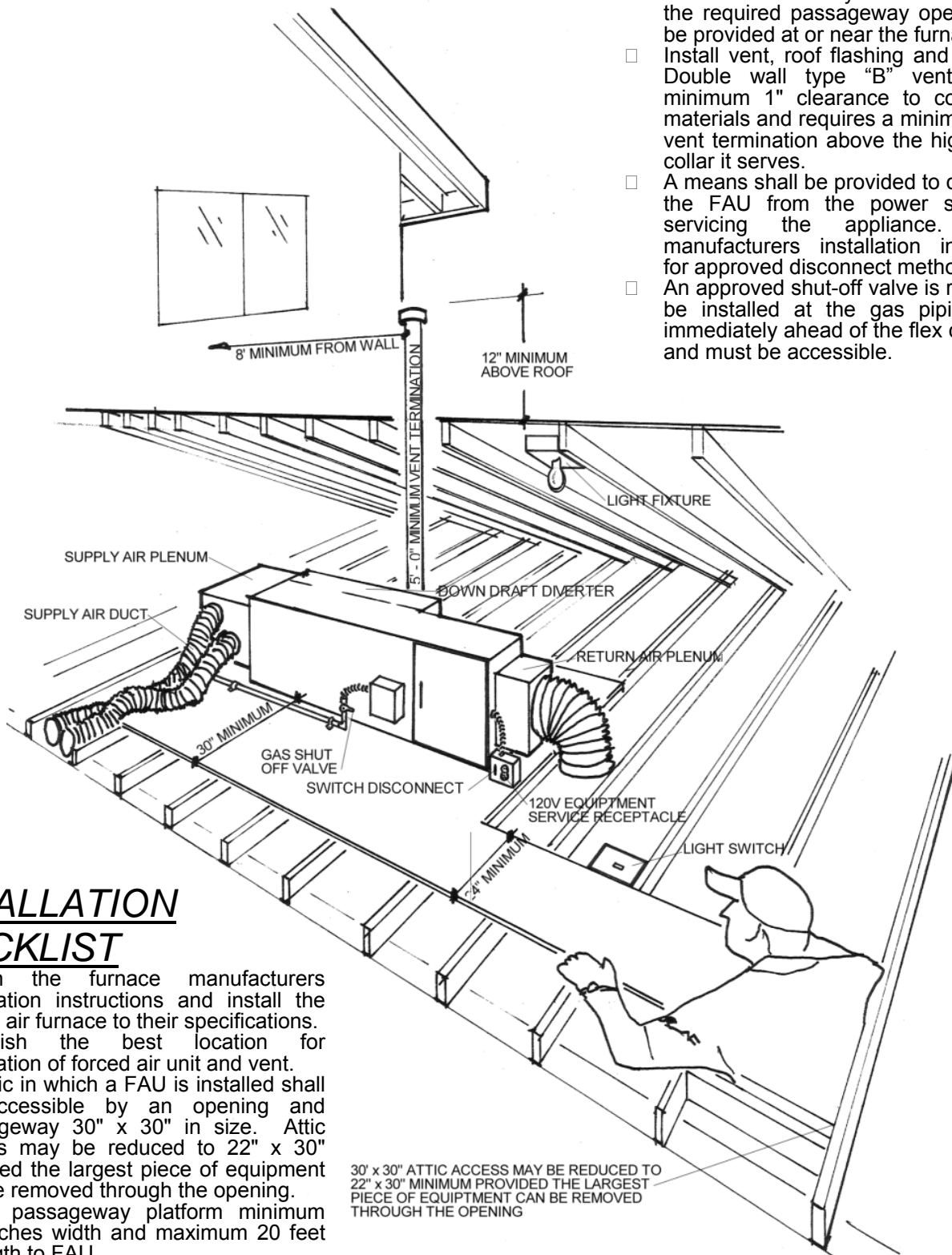
1. All equipment for which a permit is obtained under this code shall be inspected by the Building Official or an authorized Inspector. The Manufacturers Installation Instructions **must** be available for the inspector at the time of inspection.
2. That portion of any equipment intended to be concealed by any permanent portion of the building shall not be concealed until inspected and approved.
3. When the installation of any equipment is complete, a second or final inspection shall be made.
4. Equipment regulated by this code shall not be connected to the fuel or power supply until authorized by the Building Official.
5. Exception. The requirements of this section shall not be considered to prohibit the operation of any heating equipment installed to replace existing heating equipment serving an occupied portion of a building. In the event a request for inspection of such heating equipment has been filed with the department not more than forty-eight hours after such replacement work is completed, and before any permanent portion of the building conceals any portion of such equipment.
6. A final inspection approval may, upon notice, be revoked by the Building Official if he finds that the heating, ventilating, cooling, or refrigeration equipment fails in any respect to comply with the requirements of this code, or that the installation is unsafe, dangerous, or a hazard to life or property.

MECHANICAL DETAILS, DIAGRAMS AND TABLES

- TYPICAL INSTALLATION OF FORCED AIR UNIT IN ATTIC Page 103
- TYPICAL INSTALLATION OF WALL FURNACE Page 104

TYPICAL INSTALLATION OF FORCED AIR UNIT IN ATTIC

- ☐ Install working platform not less than 30" in depth and width in front of the entire firebox side of the FAU.
- ☐ A permanent electric outlet and lighting fixture controlled by a switch located at the required passageway opening shall be provided at or near the furnace.
- ☐ Install vent, roof flashing and vent cap. Double wall type "B" vent requires minimum 1" clearance to combustible materials and requires a minimum 5' - 0" vent termination above the highest vent collar it serves.
- ☐ A means shall be provided to disconnect the FAU from the power source for servicing the appliance. See manufacturers installation instructions for approved disconnect method.
- ☐ An approved shut-off valve is required to be installed at the gas piping outlet, immediately ahead of the flex connector, and must be accessible.



INSTALLATION CHECKLIST

- ☐ Obtain the furnace manufacturers installation instructions and install the forced air furnace to their specifications.
- ☐ Establish the best location for installation of forced air unit and vent.
- ☐ An attic in which a FAU is installed shall be accessible by an opening and passageway 30" x 30" in size. Attic access may be reduced to 22" x 30" provided the largest piece of equipment can be removed through the opening.
- ☐ Install passageway platform minimum 24" inches width and maximum 20 feet in length to FAU.

TYPICAL INSTALLATION OF WALL FURNACE

INSTALLATION CHECKLIST

- ☐ Obtain the furnace manufacturers installation instructions and install the furnace to their specifications.
- ☐ Establish location of the wall furnace. Maintain 6" minimum from the inside corner of rooms and 12" from the swing of doors and windows. Establish best location for installation of vent.
- ☐ Cut out double top plate in a minimum 4" nominal wall to a full 14 2".
- ☐ Head out any ceiling joists that will be closer that 1" to the vent when installed.
- ☐ Cut hole in roof sheathing to accommodate vent penetration.
- ☐ Install furnace header plate in the stud bay. Secure with screws or nails.
- ☐ Attach hold-down base plate to furnace header plate with sheet metal screws.
- ☐ Install ABW≡ gas vent in stud space that is free of obstructions. Snap vent into hold-down base plate. Snap sections of vent together. Maintain 12' minimum vent termination from bottom plate to top of vent.
- ☐ Install listed ceiling plate spacer. The plate spacer is designed to center the furnace vent in the stud space and to allow heat to dissipate from stud space into the attic space above.
- ☐ Install AAttic Shield≡. An attic shield is a sheet metal sleeve that shall extend around the gas vent from the top of the ceiling plate into the attic at least 12" or to a point 2" below the roof sheathing.
- ☐ Install roof flashing and storm collar.
- ☐ Install vent cap.
- ☐ Install gas line to stud space serving wall furnace.
- ☐ Provide gas test. Install thermostat wire.

